## Introduction to Longevity CEO and Dr. Hanno

And what we show is that the patients who got the fasting mimicking diet for five days a month used much less medication than the group that got to regular treatment.

So the majority of the patients who were treated with medication at the start of study who used the fasting mimicking diet could stop that medication.

And while in the control group, people used more medication, at end of 12 months. This is the Longevity CEO, where we explore the science of metabolism, cellular renewal and the future of longevity.

This is Dr. Joseph Anton, and it's a big pleasure in this session to be hosting Professor and Dr Hano, who has been one of the most, one, of, the leading experts actually in fasting and longevity has done multiple clinical trials on fasting in longevity.

And he's, a prominent doctor in, at the Leiden system of hospitals in Netherlands, One of leading European hospitals and healthcare, but also in Fasting and Longevity.

So I would. Invite Dr. Hanno to first introduce himself, and then we're going to have a big discussion on how can fasting contribute to longevity. And Dr Hano has done a lot of trials on fasting for cancer patients and fasting, for diabetic patients, what those trials have been about.

What are the outcomes and how people today benefit from these interventions? Welcome, Dr, Hanna. Thank you, Joseph. It's a pleasure to be here. Yes, as you told the audience, I'm a doctor, a clinical endocrinologist actually at the Leiden University Medical Center, and I am a professor of Diabetology.

I've been interested in the health benefits of fasting for a very long time now, approximately I would say 15. I became interested, in aging and the aging process.

And I learned about the trials that showed that fasting or intermittent fasting actually can extend lifespan and also improve health.

## Dr. Hannou2019s Background in Fasting Research

And I was intrigued by the idea that we could perhaps help my patients and other patients with fasting. That's why I started doing trials investigating the impact of fasting at first on cancer.

in particular the effects of fasting and chemotherapy in breast cancer. And then just recently we did a trial to evaluate the impact of periodic fasting in type 2 diabetes, which we in the details we probably will go into a little later.

But, um, you know, I strongly believe that, that that fasting is a powerful intervention to, to improve health in, in particular, and perhaps it will also extend lifespan in humans, but that's less certain.

But I think it definitely has benefits for health. That's fantastic. And, uh, And you, know I've had the chance to meet you probably maybe eight, nine years ago.

On a trip, you were coming to Los Angeles and partnering with Dr. Walter Longo on the fasting trials at USC, prominent fasting experts and have tracked you for the last seven, eight years.

The work that you've done at Leiden has been unbelievable. It's going to change in the medium and long-term the

way we do medicine. Today we did medicine with drugs mainly, and I think you worked on fasting and the Fasting Mimic Nutrition to have an alternative support for doctor and patient.

when it comes to cancer and diabetes. Should we separate maybe cancer diabetes and talk about the concept why to do fasting and fasting nutrition and why periodic fasting for like a patient, you know, it seems you worked on breast cancer.

Can you tell us a little bit, how come a person that could have breast or there are other trials probably happening on other cancers, but why a patients would do fast?

And what it does biologically to the body when they have such a condition. Yeah. So you, you have to realize that fasting is an intervention that will protect your body against all kinds of stressors, all kind of.

toxic agents and other threats. And I always like to think in evolutionary terms, because in the old days, you know, thousands of years ago, humans were often faced with food shortage.

And it was essential to survive these periods of lack of food. And that's how our physiology actually developed. It developed in a way that when there's a shortage of foods, our healthy cells start protecting themselves against all kinds of threats.

## Why Fasting Protects Healthy Cells During Cancer Treatment

to survive that particular period of food shortage. And at the same time, we know since not so very long that cancer cells cannot protect themselves, do not react in the in same sense.

So they cannot switch to this cellular mode of protection. And they actually suffer from, from nutrients shortage when, when we fast. So this concept, which is called differential stress resistance was discovered actually by Walter Longo.

You mentioned before, and years ago we thought, well, this is something that we should try to see whether when. We apply that to patients who have breast cancer and get chemotherapy.

This chemotherapy is obviously bad for cancer cells, but it's also bad, for healthy cells. And the idea was when we have people fast around chemotherapy, of course, then their healthy, cells may get protected against the threats of chemotherapy.

While the cancer, that cannot make that switch get more sensitive to the chemotherapy and that's why. We tested the possibility that fasting or at a later stage we did fasting mimicking diet or we go into in a minute, I guess.

Fasting mimicing diets would do two things in patients with cancer. First, protect healthy cells against the threats of the chemotherapy. Secondly, render the cancer cells more sensitive to the chemo therapy.

And that's basically what we, what, we evaluated over the last, let's say 10 years. So is it, is that when there's no food, did normal cells say, well, We're in fasting mode.

Let me protect to survive and let me, uh, not replicate and not grow and that invest in expansion and just protect myself and rejuvenate. You know, we hear the word autophagy with fasting, there's other ways that fasting induced rejubilation as well.

And it is that the cancer cell by definition loses its inhibition factors and keep growing and then needs Needs food to be, to survive and need the growth factors as well.

And now it's being lost and deprived of fasting and therefore gets weakened and sensitized to the chemo intervention or the hormone intervention, whatever intervention is happening.

That's exactly how it is. We did two trials, a very small trial at first to see whether it was safe to fast around the chemotherapy. Is that water? That was water only fasting.

How many days? In total, around the chemotherapy for the first study was two days of complete fasting and it turned out to be very safe. There were no major side effects and also we had indications that the fasting actually protected healthy cells.

That there was less DNA damage in healthy cell. We tested that and the trial was too small to actually determine whether the fasting sensitized the cancer cells for the chemo.

But since we learned that it was safe and it appeared to reduce damage to healthy cells, We thought we have to do a bigger trial to see if we can actually show that the cancer gets more sensitive and that it reacts more strongly to the chemo.

## Fasting-Mimicking Diet in Breast Cancer Trials

And that's actually what we did in the second trial. We did show in that particular trial that cancer cells, this was again in women with breast cancer, How many participants in the trial?

128 in total. Was that on water fast or on a fasting nutrition? No, that was a trial we did with a fast so-called fasting mimicking diet and this is a diet designed to mimic the effects of water only fasting but you can eat something because, and in particular, healthy fats, but no, very little protein and virtually no carbohydrates, the refined carbohydrates.

And that particular diet has similar effects as total, it is water only fasting. But you can still have some calories, which makes it a bit easier for people to do it.

So this particular trial, there were 128 people that half of them got an advice to eat healthy around the chemotherapy, just no specific advice, but eat as healthy as possible.

And then the other half got the fasting-mimicking diet. And what we showed was that the response of the tumor appeared better in the, in, the people who used the fasting mimicking diet, which was three days prior to chemotherapy and on the day of chemotherapy itself.

And, and that it's a four day nutrition protocol. Basically it is. Yeah. The patient starts the fascinating mimicing diet say. chemotherapy day minus four minus three minus one and the day of the chemotherapy.

Exactly. That's how it is. And that study showed that there was a stronger and better response of cancer to the chemo. However, unfortunately, the power of this study was not enough to be absolutely sure.

So that's the reason why we currently do a second study to confirm those findings in an even bigger study population. So we have to wait for the results of that particular study before we can definitely advise people to do the fasting mimicking diet.

That's fantastic. And how many people in the new trial? 250. At least, I'm not completely sure whether it's even 450, but I have to look into that. But we did a very, very thorough power calculation now and it is a lot more people.

That's fantastic. A lot of cancer patients, breast cancer patient actually gain weight. So probably also they're getting a little bit of help with the fasting-mimicking nutrition.

But some cancer patients lose weight with cancer. Does the fasting-mimicking diet, does that induce more weight loss or it protects sling body mass and just cut the fat?

Or can you talk a little bit about the impact of the fasting nutrition for patients and regarding their weight as well? Yeah, it, um, if you use a fasting mimicking diet for a longer period of time, over a couple of months, for example,

every, let's say four to five days, and then every month, five, uh, Every month the fasting, mimicing diet, then you actually tend to lose weight in particular fat loss while muscle mass is preserved.

That's something that we showed just recently in the diabetes trial. We did critical. That a very critical, uh, that's a discovery because typically perceived weight loss diet or the word diet, you know, doctors and patients perceive that they're going to lose weight.

And when you lose. You lose muscle as well. Yeah. But what you're saying here is that the fasting nutrition is a fat loss, but protects the muscle, which is critical for the diabetic and cancer patients.

We know that there's a lot of companies that specialize in those protein drinks as well, which, you know, I don't know how controversial it is to drink high proteins when you have cancer and you're feeding the cancer rather than starving the.

And maybe this is an important balance with the fasting nutrition whereby. We're supporting, creating the, you're creating, the right environment for the body to host the chemotherapy, but you not compromising on the muscle loss.

## Weight, Muscle Preservation, and Cancer Nutrition

Yeah. Um, well, I think, a lot of cancer patients get a, lot, of protein to preserve that, that muscle mass to, to keep them functional, optimally functional in terms of, in, terms, mobility, In terms.

But at the same time, i'm not so sure whether that is healthy, precisely because what you say, you somehow feed the cancer cells with all that protein as well.

Just as you probably feed your muscle mass, but so a fasting mimicking approach appears to be very useful because it makes you lose fat while it preserves your muscles mass.

And there's not so many calories and protein in particular in there. That might be a very, you're right. It might. Which is, which is. Contrary to the, to what the word believes, right?

When you say, oh, your not going to give my patients high proteins. Is that good or bad? Because we've all, I went to med school, he went too much school.

Everyone, when we go and talk cancer is like go on low on carb, but then get your proteins, Cancer is the fastest growing cell in the body once you have cancer, right?

And, and the more proteins we're giving that patient, we are helping a little bit on the muscle, but we were feeding cancer. You know, a great source for it to grow and we spiking IGF as a response, which again pushes the cancer for extra growth, Right?

Yeah. Yeah, You're absolutely right. You are absolutely. Right. So this cyclicity of fasting and nutrition, I protect the muscle. I optimize the body around chemo.

Then maybe if that patient is a little bit cachectic after or needs some muscle, but like maybe certain proteins after and maybe plant-based and. But more on the ketogenic side, maybe is that something that you're, you are recommending so that, so you balance feeding the buddy, about not overfeeding the cancer.

Yes, of course. Of course, there's cancer patients who lose a lot of muscle mass and that impairs their strength and their mobility. And then you should make sure that there is to protect that muscle loss.

You can do that perhaps by eating in particular plant-based, a little bit of plant based protein. But you have to take care, I'm sure, not to eat too much animal protein to make sure that you do not feed the cancer as well as you feed your muscle mass.

So you're absolutely right there, in my opinion. Well, we're excited to see where medicine is going to takes us. This is pretty exciting to how food is medicine can tag team with.

with the current drugs and the standard of care and potentially protect the body or enhance the outcome. I mean, cancer has been always the struggle with medicine.

So hopefully with your work in the future, it seems you're onboarded a very exciting high number of participant trials. And hopefully that can show significant results where I think patients around the world and doctors will be very excited to see the outcomes of that one.

Yeah, I think so too. So it happens that, because if you believe in fasting and your leadership at Leiden again, which is one of the best university health system that I know of in Holland, you also did another trial on diabetes and used the fasting-mimicking nutrition as well for diabetes.

Can you talk a little bit about that protocol? Why the science? why doing fasting nutrition for diabetic patients? What was the protocol and some of the outcomes?

Yeah, so we did a study in 100 patients with type 2 diabetes. So there's two different types.

## Type 2 Diabetes Trial and Reduced Medication Use

Type 1 is with the juvenile form. And then there is type two, usually associated with overweight and obesity. We did study and 100 patient who are overweight with Type 2 Diabetes.

And what we show that one half got a fasting mimicking diet for five days, once a month, and the study lasted for 12 months and they got regular diabetes care as indicated by Dutch guidelines.

And the other half of the patients got just the regular treatment. And what we show is that the patient who got the fasting mimicking diet for five days a month used much less medication than the group that got to regular.

Treatment. So the majority of patients who were treated with medication at the start of this study. who used the fasting mimicking diet could stop that medication.

And while in the control group, people used more medication at the end of 12 months. So that's while their glucose control was, well, it was a tiny little bit better in their fasting-mimicking-diet group.

Although it wasn't statistically significant, but it is a little better. And while they used much less medication, there was no increase of their glucose levels, right?

So you're saying the fasting nutrition had allowed the doctor to decrease the medication while the HB1C is staying stable or decreasing a little bit, so they're avoiding the need of medication and controlling the blood sugar at the same time?

Exactly. That's what happened. And then, you know, we also show that if you use that fasting mimicking diet in this way over a year, and you lose fat mass, Body weight, which is particularly a fat mass because there is minimal loss of muscle mass.

While in the control group, there was an increase actually of body weight. And this is not unusual for people with type two diabetes or any one of us.

Basically we tend to increase weight over time, but that was counteracted by the diet. So I think we actually show very beneficial effects of the fasting mimicking diet in type two diabetes over a year.

Dr. Haddad, this is one of major reasons why I personally departed from the clinical aspect of medicine and went into the discovery and development of healthy nutrition.

It was diabetes and cardiovascular. I, I a little bit couldn't comprehend the system of, so we, we say diabetes treatment is keeps the blood, blood sugar in a certain range.

90% of the medication that does that, does it not by disappearing glucose, but by just transporting it further into the cells, which then the excess glucose gets into fat, Which then increases insulin resistance, for overproducing insulin, which then advances the patient in the disease forward and get them more dependent on more drugs and then get their pancreas failing with time and getting the need for insulin.

And I couldn't comprehend the system where to fit within the regulatory definition of a disease, just keep the glucose within range, therefore send it somewhere else and that somewhere is doing more damage because it's creating more insulin resistance and pushing the patients forward in their disease.

I just couldn't comprehend that system. And that is like, it's an, an un-conspired of course, but it is kind of somehow the evolution of the, of this system was just to get to, I've never seen a disease where the more you take medicine, the you move forward with the disease.

Yeah. I always say diabetes type two, to a certain extent, there's obviously genetic predisposition, lifestyle, et cetera, But it to 80, 90% It's a foodborne disease, right?

It said it's the disease of it. It is a prolongation of the overweight and insulin resistance pattern. And the solution, what you're saying today is, okay, you can eat healthy and under eat.

You lose some muscle with it, but hey, we discovered that maybe a fasting, mimicking nutrition helps you to lose the weight faster. But because it is the stress on the cells, the muscle gets protected and you are not decreasing muscle mass.

So you hit two birds in one stone. The diabetic patients. wants to protect their mass, that's critical for them not to pick up fat again fast and you want them to quickly reverse insulin resistance and needing less medication.

And probably this is what, this what the magic of the study that you did that, you led is, is that satisfaction of it is a lot of. If you eat healthy with a Mediterranean diet or a lot of other healthy nutrition, you will decrease HP1C and maybe need for medication.

But the weight loss is, is it used by fat and muscle. And I think this is where a lots of doctors struggle and a a of patients struggle. and I this what's going to happen with Ozempic and right?

And we'll go with it all now, this big hype with the GLB1, we're seeing the patients losing weight fast, but they're losing muscle fast. You're going to gain weight fast and it's mostly fat.

You don't gain muscle fast. you're creating bigger insulin resistance. And you go back deeper into the disease. It's like a lifelong dependence on the new drugs rather than a freedom from medication from them.

Yeah, you know, I think that a major issue in the treatment of type 2 diabetes and many other chronic disorders, by the way, as we do it now, is that, we try to correct the physiological consequences of our behavior of, in, the case of Type 2 Diabetes, food intake is a measure issue.

So we try to correct the consequences of the wrong food in combination with genetic factors. And also, don't forget the microbiota, the bacteria in our gut.

## Dietary Intervention, Metabolic Health, and Closing Remarks

So in interaction with what we eat, glucose levels increase and what we do with medication is we try to correct that while people keep on doing the wrong thing basically and as long as you do not correct the food intake, whether you that with a fasting-nimicking diet, well we show now that you can do that by eating a fasting-mimicking diet for a couple of days a month.

There's alternatives, of course. You can also continuously restrict your calories in a prudent way, but it's very much more difficult to do that than to periodically use a bit more stringent regime.

But you have to something. As long as you keep on doing the wrong thing while taking those medicines, this disease is progressive. Exactly why you know, you explained that that excellently.

I think so. So this is fundamental. Dietary intervention is fundamentally to the treatment of type two diabetes. And I learned, I always learned that it's a chronic progressive disease.

You know we heard that on medical meetings over and over again. We both went to best medical schools and still thought it was right. I don't know how many hours of nutrition you took.

I took one, MD, PhD, two master's, all of them, I just took on session on nutrition. And that's the main cause of the disease that majority of people with overweight end up with.

Yeah. Now I think I can't even remember, maybe zero. It's virtually nothing on Nutrition. while nutrition is the basis of our health. I'm convinced that that is true.

Dr. Hanna, I think that trial was done, finished, and now there's a version of the fasting-mimicking nutrition that was recently launched in people, in the U. S.

and then next year in Europe. can access that. Can you, can you a bit talk about the protocol of such a nutrition? Like when, when a patient should do say I'm a diabetic type two patient and I am on three or four drugs.

When should I take this? If I go to my doctor and talk to him about it, what should tell him? What, What am I suggesting here? Well, You know, we use that, or our patients use the diet for five days every month, but we are not sure whether, you know you can even do it for every, like every two months for 5 days.

That may be effective as well. We simply don't know. I appreciate you very much Dr. Hando for the great session today on generally fasting for longevity and specifically focused on the use of fasting and fasting-mimicking nutrition.

for, you know, certain group of patients, especially you studied breast cancer, how to use that in cohesion with the current chemotherapy and, and using the fasting-mimicking nutrition, uh, for diabetic patients.

The protocol I think you tested was once a month for six months and then once every three months to maintain and to help them regress for the first time from their health conditions.

I this is what, um, Some of those summits we are excited about is just to bring that cutting edge technology in nutrition and how nutrition as medicine as a tool for longevity can join hand in hand with the current medication and the health care community and empower the patient and a doctor to have additional tools to support their patients.

Appreciate you very much. Thanks for listening to the Longevity CEO. Follow the show and join us as we rethink what it means to live longer and healthier lives.