



Intermittent Fasting #FadOrFuture Online Event Transcript (5th April 2018)

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Slide 1: Welcome to the Intermittent Fasting #FadOrFuture online Event

[00:00:01] **Matt:** It's Matt O' Neill, dietitian from the SmartShape Center for Weight Management welcoming you to the Intermittent Fasting #Fad or Future Online Event. This is one, very popular topic, and we know it's trending and I'll show you some data on it and it's something that a lot of people are curious about, not just for their clients but individually in terms of how they are eating. It's something that's buzzing around the Internet as well. So, I'm looking forward to share some really powerful insights and practical tips for you today. I'm just going to do a brief introduction and then handover to the speakers.

Slide 2: Webinar Learning Objectives

[00:00:40] The webinar learning objectives for today are very straightforward.

- Simple aims of this webinar are to update your nutrition knowledge know-how and opinion on intermittent fasting and dieting.

Of course, we'll see the different definitions between those.

Slide 3: Recorded package includes

[00:00:56] Your recorded package includes a lot of stuff here. You get the webinar recording video, the slide PDFs, the summary that I will do for you, a transcript PDF, web links and references, plus a CPD quiz. So remember, as for all Smart Shape webinars, it's a lot more than just a webinar, it's a complete learning package or value package for you.



Slide 4: Informing, inspiring, engaging, and energizing

[00:01:18] If you're attending this webinar after you've done other fad or future events, so this is the fourth fad or future event after a low carb diets, ketogenic diets, high protein, protein supplements fad or future, so thank you so much those that have attended multiple webinars. I would certainly encourage you to explore those webinars at Smart Shape. Not only fad or future also dietetics disrupted, Mastering motivation, appetite management, hopped on a lot of topics particularly if your band is weight management. And what's much hype it's about inspiring you to actually help your clients more with the knowledge and the know-how. So, if there's other resources please let me know.

Slide 5: Intermittent Fasting #FadOrFuture? Sessions

[00:02:05] Our lineup for today includes my brief introduction, and then we're going to have Leonie Heilbronn talking about five and dots and definitions. Then Amanda Salis about what happens in your body when you're intermittent fasting. And then Jackson Peos will look at from the athletic point of view too with body building in terms of what happens when you want to achieve physical goals as well with intermittent fasting.

Slide 6: Please follow and share and on social

[00:02:30] Of course, please follow and share this on social. If you'd like to take any screenshots of the slides please, please do. Share those on social. Use the tag #FadOrFuture? There are the social media accounts as well. Of course, don't copy it alone, but please share as you please as you go through.

Slide 7: Matt O'Neill

[00:02:50] Now my introduction here is just going to really set the scene and show you what's really buzzing around out there. A bit about my background first. My first degree was on Exercise Science which taught me about metabolism, and then I got curious about what do you put in your body, what happens with foods? And then I followed on to do Dietetics with nutrition qualifications. Then I've gone into coaching people, creating weight management programs. I've been lucky enough to travel world educating eight contraries. My own weight management program Metabolic Jumpstart has put 25,000 people through. I guess I come at it from all different perspectives to look at how we really meet our client's needs for weight management and nutrition. At the moment of course, I'm very selfish in terms of learning, so, I really appreciate what the speakers have to share here.

Slide 8: Matt O'Neill's session topics

[00:03:38] In my session I'm really just going to look at the buzz and then who's promoting intermittent fasting. So let's jump in.



Slide 9: Google trends

[00:03:45] If we look, at Google Trends about intermittent fasting, you can see the graphic here and you probably gather that it's been increasing from March in 2010 through 2016/17 and above right up to the end of last year, intermittent fasting has been rising. And this graph is sort of replicated over the last 10 years as well. This is a real popular topic and no wonder people are actually finding out about this and joining online groups.

Slide 10: 5:2 Diet Australia

[00:04:12] For example, this is perhaps the largest Facebook group for intermittent fasting, 5:2 Diet Australia. And if you look at the bottom right here, you can see there are over 55,000 members. And when I go through the feed I see all sorts of things from people saying, "I'm on my first fast what do I do? Here are all my foods for my fasting diet. Or I've fallen off the wagon, or here are my low calorie foods, or these are my symptoms, can I do it when I'm breastfeeding?" All these things. And although we won't cover probably all those questions today, we're going to try and hit 99% of the questions related to intermittent fasting.

[00:04:50] There are lots and lots of books out. And if you look at these ones here, there's a book called Intermittent Fasting. There's another book called Intermittent Fasting. There's a third book called Intermittent Fasting. And then there's the complete guide to fasting, and then Delay, Don't Delay, Living with an Intermittent Fasting Life. So we're talking about a lifestyle for people. And then the book on the bottom right here, the Fast Diet.

That's sort of what really kicked it off by Dr. Michael Mosley. He's a cereal experimenter in different diets, and so he really wants to explore, do these diets for himself and that's obviously what has created this sort of viral spread about intermittent fasting. But as you can imagine with all these books, it could be a little bit confusing what exactly is intermittent fasting.

[00:05:36] Well, let's have a look at some memes to give us an idea. You're starving yourself, it's called intermittent fasting you moron. It's not just fasting. The two stages of intermittent fasting, so hungry versus so full. So do people go from one to the other? Is there any medium?

That look you give when people keep offering you food and you're fasting. So how do you do that in the real world? The most important meal of the day to skip, try intermittent fasting. So there's debate, do we actually need to eat breakfast? Yeah I started intermittent fasting; I fast from 12:00-6:30 A.M, which is when people might sleep normally. So, does that qualify? Fasting a regular training, are you freaking crazy? That big question that I heard Jackson can answer for us. Does intermittent fasting become compatible with actually doing a lot of exercise?

You think intermittent fasting is ready for prime time? Tell me how that works out for you. So is intermittent fasting something that will continue to spread? Is it something that will become a normal sort of tool in the dietitians toolbox for their clients? Or is it something like other trends will peak now and will go way? And that's what we want really answer today.



[00:06:54] So the big questions are going to be what qualifies as intermittent fasting. Is intermittent fasting superior for weight loss? Are there any metabolic benefits may be associated with or independent of weight loss. Does intermittent fasting come with any risks? What are the downsides? How does it affect appetite particularly on your fasting days?

And can you do intermittent fasting and keep muscle? You know I'm going to say this, is intermittent fasting a fad or is it the future? That's what we're aiming to work out today.

Slide 11: Intermittent fasting

[00:07:26] And for that, I'd like to introduce our first speaker, Associate Professor Leonie Heilbronn. Leonie is one of the big brains that we've got on this topic to learn from her insights because she has been researching intermittent fasting. And one of the things that Leonie got was a grant in 2014 to look at the effects of periodic fasting on the inflammatory profile in serum and adipose tissue. She's also received an NHMRC grant to really look at this as well.

She completed her studies in 2001 with a PhD and she's really looking at the interface between clinical signs and actually helping people out with their metabolism. So, she's a Research Council future fellow at the University of Adelaide, and she's based at the South Australian Health and Medical Research Institute in their obesity and metabolism library. I'll follow up with links that you can connect with Leonie in terms of her social media contacts as well.

Session 2 – More than 5:2 – Variation and Evidence, by A/Prof Leonie Heilbronn

[00:08:25] Now, Leonie is going to cover up definitions. What protocols have evidence, and if intermittent fasting diets versus the rest of weight, how do they compare. And should I fast to leave longer? Because that's also a big question that comes out of it from there. What I'm going to do is just do the technical part and hand over to Leonie to make her presenter. And then I will just confirm when your slides come up and we're ready to go.

Leonie: Okay, can you see my slides?

Matt: I can't see them yet. So just check that you've clicked, confirm and they've come up there.

Leonie: What have I done?

Matt: That's all right. This normally usually takes a couple of clicks.

Leonie: No, still can't see.

Matt: That's all right. I'm going to just go back and make main presenter and then I will switch back to you and you should see that all along

Leonie: Here we go. I got it that time.

Matt: Perfectly fine, and I can see that coming up now. There you go. And Leonie, if you could just make that progress to presenter mode. That's all right. Wonderful, ready to go.



Slide 1: Intermittent Fasting for Health.

What do we mean and what is the evidence?

[00:10:15] Perfect. Sorry about that. Little bit of technical issues. Okay, so today, I'm going to be talking about intermittent fasting for health, what do we mean by that and really what is the evidence that's out there to date.

Slide 2: What I will talk about today

[00:10:27] I have added a couple more on top of what of Matt said I'll be talking about, and first I'm just really going to define caloric restriction because that's really what we're comparing with the gold standard method that's been out if for a long time, whereas fasting is coming out there is an emerging alternative to caloric restriction. And then I'll be talking about what do we mean when we say intermittent fasting and there's lots of different types of intermittent fasting out there.

I will also be telling you what kinds of fasting diets have evidence in humans and to see which ones are better for not just weight loss but what I'm more interested in really is health outcomes. So weight loss is great but really we want to maximize our health and reduce our risk for diabetes cardiovascular disease, and finally touch on should I fast to live longer?

Slide 3: Caloric restriction

[00:11:18] So caloric restriction. What we've known from I think the 1930s is that caloric restriction increases lifespan and it does this in a number of models like in mice, flies, yeast, worms. They've now recently shown this in monkeys as well, that caloric restriction increases lifespan, and it also increases biomarkers of longevity in humans. Now we can't actually run longevity or lifespan studies in humans because it would take a hundred years but we can look at biomarkers.

So in this graph here we've got a study that you know restricted mice by their twenty five percent of their energy requirements right up to sixty five percent of their energy requirements and what you see is this dose dependent increase in lifespan and this is the control mice that is caloric restricted.

So we see this dose dependent increase in lifespan in mice and similarly in monkeys when we have a look at monkeys that we either restricted by twenty five percent of the calories or fed ad libitum they had this increase in their lifespan. This is an average lifespan rather than a maximal lifespan. I haven't actually quite finished the study yet, there are still some monkeys alive so we'll see how long that goes out, whether they hold these.

There are actually two colonies of monkeys that have these experiments going in the US where one is at NIH and the other one is at Wisconsin. So these animals have been examined for almost twenty years and one of the groups showed that caloric restriction was increasing lifespan and the other monkeys are showing no advantage of caloric restriction for lifespan. So the evidence is a little bit out there I guess for longer lived primates as to whether this will work for sure.



Slide 4: Caloric restriction

[00:13:08] Caloric restriction definitely improves metabolic health span so you reduce diabetes risk and studies have shown in more than three thousand people that caloric restriction actually works more effectively to improve diabetes risk factors than say drugs like metformin. Metformin is a drug that people with diabetes go on to help improve their glucose metabolism.

So caloric restriction is better versus this this drug and this had significant legacy effects. So they looked after ten years and the groups were still I guess more healthy in the caloric restriction group versus the metformin group. It also reduces cardiovascular risk factors so you improve your blood lipids, reduce cholesterol levels, and reduce triglyceride levels.

Caloric restriction also reduces fatty liver and as Matt was touching on before will reduce inflammation. Caloric restriction also makes us more resistant to mild stresses, so when something comes along that's stress to our system if your caloric restricted you actually can respond at a better response to that stressor than if you are on an ad libitum diet.

I'm sure Amanda is going to be talking about this much detail but caloric restriction is very difficult to maintain long-term so it makes you hungry and also the body mounts all these physiological defenses to reduce our energy expenditure to try and stop us losing weight. So really we've been searching for alternatives to caloric restriction that may be maybe easier to maintain long term or maybe providing better health benefits or that we can do it intermittently.

Slide 5: Caloric restriction

[00:14:49] Just before I go on to talk more about intermittent fasting, I just thought I touch on what happens in the body in terms of diabetes or in terms of how the nutrients are taken up by the body and what happens because this is where our main focus of research really is. So when we eat feeds the glucose is released into the bloodstream and it gets taken out. It stimulates the pancreas to produce insulin to get those muscles to take up the glucose and the liver to take up glucose, and it also shuts down glucose production by the liver when we it. So we don't need to make any more glucose so it shuts down.

It also shuts down the fat cells from releasing fat; as soon as we eat the insulin shuts it down. As we become overweight we become resistant to the actions of insulin. So when we are resistant to the actions of insulin it doesn't work as well to shut down the fat released from fat cells and we get fat building up in our muscle, and we get fat building up in our liver.

Eventually the system starts I guess breaking down and we can't keep producing more and more insulin to overcome this insulin resistance. That's when we get type two diabetes with the glucose really ramping up into the bloodstream.

Slide 6: Alternate Day fasting an alternative?

[00:16:09] So is alternate day fasting an alternative to caloric restriction? This was first looked at back in 1990 and this is a mouse study and what they showed was that alternate day



fasting increased lifespan if it was introduced at one or two months of age or it was introduced six months of age in mice. It's increasing here is the mice that were fed ad libitum, and this is the mice that were fed every other day so they were completely fasted every other day.

And what they say was these benefits, these lifespan benefits were occurring really without any change in body weight. So this mass was about three percent lower in body weight and this mass body weight were not different and had this increase in my span.

This is for the first time suggesting that maybe fasting is producing some effects that are independent of body weight to increase or independent of overall caloric restriction to increase life span.

Slide 7: Alternate day fasting improves mouse health as effectively as CR but without weight loss

[00:17:03] This is one more mouse study that really stimulated my interest in this area. It was back in 2003 and we conducted out this human study straight after the study was published. What we were looking at here is that this is a caloric restriction mouse so they're fed less every day than the other mice and these intermittent fasting mice up here.

As you can see a little bit less but similar food intake overall than that of the mice that are fed every day. Again they're not really changing body weight or very much different in body weight. This is these mice that are caloric restricted every day, but we said is not being very different in body weight. We see that there are significant reductions in glucose levels in the mice that have either intermittent fasters or fed caloric restriction, and significant reductions in these insulin levels so that suggesting that there reduced risk for type two diabetes. These mice if they're intermittently fasted or caloric restricted independent of body weight.

Slide 8: Alternate Day Fasting

[00:18:06] So since these studies there are now many studies that show that alternate day fasting is good for health span and lifespan if you're a mouse. And we see that the fasting rather than weight loss may actually provide the stimulus to improve your health. There are some studies that suggest that Fasting may be a minor metabolic stressor much like exercises that activates many pathways to rejuvenate cells and improve health.

Slide 9: What happens in humans?

[00:18:36] So I will just switch up to now the evidence for alternate day fasting in humans and what happens in humans. We see men and these men were actually monks and they lived in a monastery and they were semi fasted every other day. So every other day there were two groups, one group of monks who fed every day, and the other group of monks were only fed every other day and on their fasting day they're allowed to drink a little milk and eat five hundred grams of fruit, and this went on for three years.

What they observed was that the fasting group of monks was healthy and spent less time in the infirmary and they actually had less death. It was not significant because there wasn't



really enough people who died over that time but less monks died in the in the fasting group then in the ad libitum groups.

Slide 10: Alternate Day Fasting improves health in people

[00:19:28] This is a study we conducted back in 2005 and what we wanted to know could people do alternate day fasting and did it improve health? We basically just recruited people from around the lab to participate in this study and I did it, and my boss did it, and a whole bunch of my friends did it. Every other day we didn't eat for three weeks and we actually told people to try and eat as much as they could on their non-fasting days like the mice to see if we could mimic that. But what we saw was that people really couldn't really eat enough on their eating days to maintain their body weight.

So we see this change in body weight. After three weeks we'd lost about three or four percent of body weight that's about two to three kilos in this group of individuals though mostly lean or overweight people We were just fasting in low levels but really only on the fasting days reduced blood triglycerides which are a marker of cardiovascular risk. On both days of the day and we increased fasting free fatty acid levels in the blood. These are released from fat cells when you fast. So you are burning fat here and we're actually burning fat more effectively in the end with these studies and we see increases in ketones levels which again also come up when you are fasting.

Slide 11: ADF Improves Insulin Sensitivity in Men

[00:20:56] We also saw that the alternate day fasting improved insulin sensitivity in men. So this is a test where we gave people a glucose drink and then we only followed them out for ninety minutes, the men here I am black. So they had no change in the glucose tolerance here but they were able to significantly reduce the amount of insulin that they had to secrete in order to maintain this glucose tolerance.

So that says they are more sensitive to the actions of insulin. Interestingly though in this study, and it was only eight individuals, but the women became slightly glucose intolerant even though it didn't have a change in insulin sensitivity. So we saw this bit of a difference between the genders which really still hasn't been explored today. :

Slide 12: What is Intermittent Fasting?

[00:21:39] So what do we mean when I say intermittent fasting? All of those studies were alternate day fasting, it's really all of the mice studies have been on alternate day fasting and until recently most of the human studies were on alternate day fasting.

This book here which is by Christopher Valter, she's a researcher in alternate day fasting, this is the every other day diet. She recommends that completely every other day so basically three and a half days a week, Monday, Wednesday, and Friday, the next week would be Tuesday, Thursday, Saturday. Sorry, Monday, Wednesday, Friday, Sunday, and the next week you change around. So that is alternate day fasting she actually advises that there is a small caloric intake on the fasting day up to five hundred calories and typically eaten at lunchtimes or breaking the fast at lunch time with around five hundred calories per day.



We've got the fast diet as Michael Mosley's book, as Matt was talking about before and he's advocating to fast two days per week and have five hundred calories during the fasting period without really advising when you should eat that food. There's not as much evidence for a five two approach in the issue. Studies are actually just now beginning to come out about the five-two diet.

We have Michelle Harvie who is another scientist whose book is called the two day diet. This is two consecutive days in a row where you have a very low calorie diet so five hundred six hundred calories a day for two consecutive days, and then drink diet for the rest of the week. Finally this is per the newest diet out there.

Valter Longo, another researcher from California and he advises a five day fasting diet per month so you fast five consecutive days in a row, and by fasting he means consuming around about eight hundred calories a day during a fasting day. And he recommends a very low protein diet during this fast day and then eating normally for the remainder of the month. This is beginning to get some evidence out there to be quite protective against cancer.

Finally we have some time-restricted feeding studies. These are advocating for eating within your biological clock times but eating every day. So time restricted feeding would involve perhaps eating from 9:00 am till 6 or 7 pm at night and then not eating outside of that time window. So eating for around ten hours a day and fasting for around fourteen hours a day.

Slide 13: m-ADF improves health (8-12 weeks)

[00:24:20] So if we look at the evidence from the modified alternate day fasting and this is the Krista Varady studies where most of his studies initially were conducted between eight to twelve weeks and she allows twenty to twenty five percent of energy requirements. That's about five hundred calories per day during the fast day and she encourages the people to lose weight on these diets. So it's really trying to not overeat on those other days and to lose body weight.

What they see in an 8-12 week period is reductions in body weight in the order of 4-8 kilos reduces body fat, reduced diabetes risk, reduces cardiovascular risk. And they see reductions in markers of oxidative stress. These oxidative stress markers I guess are telling us that potentially that this is kind of like a biomarker for one of the longevity marker is to reduce your oxidative stress in the body and you can measure that through a number of different methods. The best way is to measure something called F2 isoprostane in the urine and these levels kind of like a whole body marker of oxidative stress.

Slide 14: m-ADF and CR produce equivalent weight and health benefits over 1-year

[00:25:34] This is the first longer term study of caloric restriction, this is alternate day fasting that has been conducted. This study was and had a control group as well so they had people who were advised not to change their diet over twelve months and as you can see here they didn't have any change in body weight.



And then they had to alternate day fasting who were allowed every other day fasting and allowing five hundred calories at lunch. This is unlimited 25% caloric restriction every day and what they observed was that there was no difference in weight loss, whether you lost weight by caloric restriction or by alternate day fasting for the whole twelve months. So they were really quite similar.

What they did observe after the six month period is that people in the fasting group tended to revert to more of a caloric restriction diet so they really stopped fasting on their fasting days but ate a bit less every day. So they actually kind of changed into a caloric restriction group over time so that's perhaps saying that maybe fasting isn't easy to maintain long term. What they also saw, sorry I didn't put a slide for that in here, was that there was similar improvements to health in both groups.

So alternate day fasting and caloric restriction really produced similar improvements in glucose, in insulin, they produced similar reductions in cholesterol, and other health markers. So according to this study it doesn't matter whether you do alternate day fasting or caloric restriction, they both improve your health.

Slide 15: Intermittent Fasting VS CR

[00:27:12] Michelle Harvie studies, the 2-day diet that is two consecutive days in a row of eating about 500-600 calories per day with normal eating on the other five days of the week. Again they had compared this to a daily caloric restriction group and what they saw was that body weight changes were very similar in the two groups for six months.

And they saw also very similar reductions in body fat whether you were caloric restricted or intermittently fasting, and significant reductions in waist circumference in both groups and no differences between the two groups. Or that potentially they did see that there was a trend towards bigger weight reductions in waist circumference in the intermittent energy restricted group. Waist is really hard to measure accurately and so I'm not sure how believable this this data is.

What they did see though was that intermittent fasting produced the changes in Insulin sensitivity so it was significantly better to reduce fasting glucose and insulin levels than the continuous energy restriction diet. They actually then repeated this study over three months again and have shown very similar things over. In the second study they did see that the intermittent energy restriction produced greater reductions in body fat as well. There wasn't any difference in weight between two groups but at three months the intermittent group had the biggest reduction body fat.

Slide 16: Is intermittent fasting effective as CR for health, and weight loss necessary in humans?

[00:28:44] Our study that we're funded from the NHMRC back in 2014 we were really curious to know whether intermittent fasting was as effective as caloric restriction for health outcomes and whether the weight loss was necessary.



This was before some of the studies I just showed you were published and we alternate day fasting but three days a week. Monday, Wednesday, Friday, and we advocate for eating a breakfast meal and then fasting for the rest of the day. A really large breakfast and then not eating for the rest of the day until the next day. We had four groups so the control group were given all their feeds and a percentage of energy requirements every day.

We had the periodic fasting group that we tried to make like the mice, so we tried to get people to eat more on the fasting days so that we could see in people if you maintain your body weight with fasting will you improve your health? Whereas I had a caloric restriction group which were fed 70% of their energy requirements every day, and we had an intermittent fasting group, with seventy percent overall of their energy requirements at breakfast and then they basically ate to energy balance on the other days.

Slide 17: Weight Loss following intermittent vs CR

[00:30:07] What did we observe? When we very carefully matched energy intakes between our participants we observed that intermittent fasting was actually a little bit better for weight loss. So when we provided all the feeds to everyone and told them what to eat and exactly what to do intermittent fasting produced slightly greater weight loss than a caloric restriction diet, and this is about a kilo difference.

This is the control group here and this is the intermittent fasting one hundred group that went to lose any weight. But as you can see like we showed earlier when you ask people to eat only every other day they have trouble maintaining that body weight even if you give them all the foods and say please eat.

This is just that 8-week data and so you had bigger weight loss in the intermittent fasting seventy groups were submitted body fat mass, we do this by scanning. We saw bigger reductions of fat mass in the intermittent fasting group, this is the caloric restriction group.

We also saw a trend towards a greater reduction in lean mass in this group, this is the caloric restriction but it didn't reach statistical significance. In our hands intermittent fasting was not protective against loss of fat free mass.

Slide 18: Intermittent fasting reduced markers of insulin sensitivity and cardiovascular risk

[00:31:24] We also saw great improvements in insulin sensitivity by HOMA-IR and the fasting seventy group was also better to reduce LDL cholesterol and to reduce free fatty acid levels.

Slide 19: Perceived Hunger?

[00:31:42] We measured hunger just by asking people how they felt and we did this at week one, on the very first week of the of the diet, and we did this later on towards the end of the study. What we saw was the intermittent fasting group, yes they were hungry on those fasting



days and about as hungry as the caloric restriction people were and on those fed days of course they were looking more like the control group.

We averaged this data out, potentially it didn't reach statistical significance, but potentially the caloric restriction group were a bit hungry during the initial phases of the studies overall but we lost anything by week six. It was no difference in perceived hunger.

Slide 20: 5:2 studies are emerging

[00:32:26] As I mentioned earlier the 5:2 is probably the most popular thing that people are doing but really there are very few studies supporting this approach at this point. There is one out this weight where they compared the 5:2 diet vs caloric restricted diet and what they observe was the 5:2 group had a higher attrition.

So they were more likely to drop out if they are in the 5:2 group than in the caloric restricted. But they also achieved their weight loss a little bit faster so it took them fifty nine days to achieve a 5% body weight drop vs seventy three days in the caloric restriction group.

Those that stuck to it achieved weight loss faster. They were also still very similar improvements in glucose and insulin over the intermittent fasting group was more effective to reduce postprandial triglycerides, so that after you eat the increase in the triglycerides that go through your body would on this data.

This is a baseline and the dotted line is after they did the intermittent fasting they had less of an increase in triglyceride levels following this diet and they didn't see any difference in this response to the restriction diet. When you compared the two there was a difference between the two groups with the intermittent fasting group producing triglycerides more effectively.

Slide 21: Fasting Mimicking Diet

[00:33:47] Finally, I just thought I'd touch on just one slide the new fasting mimicking diet. You can actually get this diet in Australia now – it's called ProLon - and you can go on this low protein diet for five days a week and then eat regularly the other 25 days of the month. The evidence for this is really limited at this stage but I think there are a number of studies coming out. It works in mice and in yeast so if you do the fasting mimicking low protein diet you have increased lifespan if you're a yeast cell, and you increase stress resistance.

If you're a mouse doing a fasting mimicking diet you also have reductions in cancer, inflammatory diseases, you have an increased immune response, and increased lifespan. People who have just done this through three cycles, so they had mostly lean normal weight individuals doing this diet.

What they saw was that some of the mice, we see this increase in regeneration markers, and they had reductions in diabetes, cardiovascular, and cancer risk as a result of this fasting mimicking diet. But as I said it was three months only and there was a control group that but the study wasn't conducted as well as it could have been.



Slide 22: Time Restricted Feeding

[00:35:07] Lastly, I'm just touching my last five minutes left. I am not quite sure how long you did the intro. Time restricted feeding studies are emerging now in human studies. There is very limited evidence at the moment. In mouse it really works and so this is a plot of one hundred fifty people and I gave them a smart phone application. It's called mice circadian clock and what they do is log with a photograph every time they eat or drink anything. This is 150 people over three weeks and these are all the foods that they ate during this time.

This person tended to eat from 6am until 9pm. Eating about that that many hours over the day and as you can see people were really eating pretty much from 7-8am in the morning all the way through 10-11pm at night. There was a lot of food events and so this means people are eating over a 15-hour time frame per day. Less than nine hours of fasting is occurring overnight and what they also reported from this study is that less than twenty five percent of your energy intake are actually occurring before 1 pm. Most people are stacking the calories late in the day.

Slide 23: Why is eating out of phase a problem?

[00:36:38] We've begun to realize how much eating shifts our biological clocks. This has been known maybe for the last ten years or so. We've always known we have the circadian clocks and shifts and rhythms for a lot of different tissues and it's controlled by the brain, by the light-dark cycle. But what we've begun to recognize is that eating can shift the clocks in the tissues. So it can shift to the liver clock, the muscle clock, the insulin clock, the pancreas clock, and the adipose tissue clock. All of these things can change how our body metabolizes food.

Slide 24: How long do we need to fast?

[00:37:20] In the mice what they've shown is if you time restrict animals and they've taken them between allowing them to eat for around eight hours a day up to twelve hours a day, if you try to restrict them to eating between eight to twelve hours a day. Even if you give them a fairly unhealthy diet, they're actually fitter and healthier in all their metabolic outcomes than if you allow mouse to eat ad libitum. If you take it lean mouse and you give them a very high fat high sugar diet and you allow them to eat ad libitum they become obese and unhealthy.

If you time restrict them 8-12 hours a day they are lean and fit. Interestingly they just conducted the study where they just did this on weekdays. They said time restricted food every day that you work but really don't follow this on a weekend. I'm not sure whether they did this to the students who didn't have to come in on the weekends to take the food away and give it back.

What they saw was even if they did this kind of two days off the schedule per week they still ended up with a fairly lean and fit mass. I guess that's giving for potentially an easier approach for people to not have to stick to these diets every day of the week.



Slide 25: Current evidence for TRF in human is limited

[00:38:40] As I said earlier the current evidence for time restricted feeding is limited. There are three current studies that have done time restrictive feeding that are published. People tend to don't lose a lot of weight, so 2-3 kilos over 3-12 months. This is in 8-16 people and they don't really have a lot of health outcomes reported either so we don't know whether it's working to him.

But what we do know is that in people with diabetes if they're told to eat the Calorie restricted diet as either breakfast or lunch, or as lunch and dinner they lose more weight and have healthier profile if they eat that food as breakfast and lunch. I think that there's going to be a lot of studies coming out in the future or very soon that are kind of comparing the importance of that breakfast meal again. I know we've probably been through this a lot before but we get more understanding why that breakfast meal might be so important.

Slide 26: TRF rescues glucose tolerance during simulated shift work

[00:39:48] We've conducted a study in shift workers, time restricting their food. Actually they were doing simulated shift work. We put them in a metabolic labor for 3-5 days and we test them before they do this simulated shift work for five days and then we test them again afterwards.

What we do is we say you must stay up between 8pm and 6 am and then you can sleep from 7am, or they can go to sleep and wake up again around about 3 or 4 o'clock like a typical shift worker would. But they were either allowed to eat at night or not allowed to eat it at night.

They were time restricted in their food intake just in the daylight hours. If you allow people to eat at midnight and measure their glucose response the next morning they have impaired glucose tolerance if they start going through shift work. So what can almost induce diabetes like phenotype in people acutely, but if we don't allow them to eat at midnight we can maintain that glucose tolerance.

This could be a very exciting and novel way to try and improve the health of people who are doing shift work really by limiting their food intake to the early hours of the evening or not at all.

Slide 28: TRF - Impacts of glycaemia

[00:41:08] We've also conducted a quick study of people who were at risk of Type two diabetes that didn't have diabetes for one week. What we were trying to see was whether time restricted feeding would improve their glycemic health. We have said that time restricted feeding reduces body weight body weight by about one percent that's just over one week.

We went expecting to see a weight loss potentially but we did achieve once they did reduce their energy intakes a little bit. But they improved the glucose tolerance to a meal whether they time restricted their food intake. We then put them randomized to either 8 am to 6 pm or skipping breakfast and starting to eat at about eleven o'clock to 9 o'clock at night so ten hours' time-restricted feeding, either skipping breakfast or not skipping breakfast.



Both groups improved glucose tolerance so we didn't see a statistical difference between the two groups. Time restricted feeding was effective to reduce glycaemia if it was conducted from breakfast or after a short phase delay to start.

Slide 28: Should I fast to live longer?

[00:42:16] The final question that Matt wanted to ask me is should I fast to live longer? If you're a mouse, Yes. That is definitely working. If it's a person we don't know yet, really is the short answer. We do see that intermittent fasting reduces body weight and it does improve a lot of metabolic health markers at least acutely. Long-term effects of intermittent fasting in humans are really still unclear and this is important I think particularly when weight loss starts to slow.

We also see that time restricted feeding, so not having to fast for as long a period of time might also represent a viable alternative to these strict fasting diets. I think the answer is it will definitely improve your health acutely and whether it is more effective than caloric restriction doesn't seem likely at this stage. I think you could really choose whether you want to do caloric restriction or intermittent fasting as an approach.

Slide 29: Acknowledgements

[00:43:23] I just wanted to thank the people who have done the research with me, and the funding bodies. Thanks Matt.

[00:43:31] Actually that was fascinating to see the research that come as far back as 1990, and then see your interest sparked. Then follow that right through these very well-known 5:2, and alternative day fasting. Then through to this time restricted sort of fasting and you know I'm thinking in my head when I'm meeting during the day, for example last night at 11pm and it was Jarlsberg which I absolutely love. I couldn't resist it, and I'm thinking well how am I going to give up my Jarlsberg at night. I think this is something we're all running through our head and we're running our circadian rhythm and that clock.

One question I'll have for you at the end in the discussion, and that's what I call the after party with this really interesting stuff that we get through. That is then who could be the right phenotype for this? Who could be candidate for this but who might not be a candidate, and that is a question for all speakers as you guys reset. Thanks Leonie. That was amazing.

Session 3 – Your body on a fast – individual response, by Prof Amanda Salis

[00:44:34] I'm now going to move forward to our second speaker, Professor Amanda Salis. She's going to look at your body on a fast and individual response through here now. Amanda has a Bachelor of Science from University of Western Australia. She has a PhD from the



University of Geneva in Switzerland; she's at the University of Sydney's Boden Institute of obesity, once again a specialist centre in terms of obesity research. You can see that coming through with the expertise of our first speaker Leonie.

She's looking at hypothermic control. So not only is a big brain on this topic, but looking at how the brain works. And her randomized control trials have compared the long term effects of fast versus slow weight loss, and so looking at that is it intermittent fasting is it caloric restriction. She's also had project grants from the NHMRC. So once again, very experienced. Now, Amanda is going to look at a few things here.

Professor Amanda Salis Session Topics.

[00:45:35] How hormones respond to fasting and famine, is IF compatible with appetite management? How to eat less and stick at it, and matching your diet for your biology. Amanda I'm just going to make you presenter now ready for you to accept that and also unmute you here so we can hear you. Just check that your mute is off at that end as well. And I can see your slides, ready to go.

Amanda: Can you hear me well?

Matt: Yes, I can hear you clearly now.

Amanda: Okay. Great. I'll just check ... fine. Can you see me?

Matt: Yes, Molly Charlie.

Amanda: Okay, great. Good, very good. Okay, the sound is okay.

Matt: That's all okay.

Amanda: Okay, good.

Matt: Just needed to see your presenter view.

Amanda: Okay, great. Good.

Matt: There you go.

Slide 1: Your body on a fast- individual responses.

[00:46:56] So, I'm going to talk about your body on a fast and ...

Slide 2: Disclosures

[00:47:00] Before starting I'd just like to mention some disclosures.

Yes, so I have a number of disclosures including publishing a couple of books on the subject of weight management and also receiving some funds from companies that make meal replacement products to fund research.

Slide 3: Overview

[00:47:34] So, what I'm going to look at is the hormones and how your hormones respond to fasting and famine. Looking at how we can perhaps attenuate some of these effects of hormones to match intermittent fasting diets or intermittent energy restricted diets better to



our biology. Expanding from what Leonie has presented on effects of intermittent fasting and appetite management, and a couple of tips that Matt has asked me to put me in on how to eat less and stick with it, very, very hard to do.

Slide 4: Energy restriction induces adaptive responses largely mediated in the hypothalamus arcuate nucleus

[00:48:15] Looking first at hormones the first thing to understand is whenever you're eating less than what your body needs to maintain weight balance, energy balance, or maintain weight, is that this changes the hypothalamus of your brain. And these make it progressively more difficult to keep losing weight. And it also can have adverse effects on your body's muscular skeletal integrity. So, these changes are happening largely in the hypothalamus of the brain, which is showing here.

Slide 5: Adaptive responses to energy restrictions largely mediated in the hypothalamus arcuate nucleus

[00:48:50] And if we zoom in on some of the nerve cells or neurons in the hypothalamus during energy restriction, otherwise known as dieting or increased exercise to lose weight, we see that for example there is increased expression neurochemicals that boost appetite and which reduce energy expenditure such as NPY and agouti related peptide.

And there's also decreases in the neuropeptides that reduce food intake and which increase energy expenditure. So there are the anorexigenic peptides. And altogether these and many other changes, they together work really powerfully to boost the propensity to want to eat during energy restriction. They also reduce energy expenditure, and as Leonie mentioned, these changes contribute to those dreaded weight loss plateaus that make it so hard to keep sticking to a diet and to keep having success on the weight loss diet.

Slide 6: Adaptive responses to energy restrictions in arcuate nucleus influence hypothalamus – pituitary axes

[00:49:58] Now, bringing this into hormones we know that the hypothalamus here is connected to the pituitary gland which controls many of the hormone systems in our body.

Slide 7: Energy restriction.

[00:50:12] And if we take a look at this from the hypothalamus down to the pituitary gland, we can see that there's changes in the hypothalamus in neurochemicals that control appetite and energy expenditure. They also have other knock on effects in the pituitary gland and lead to changes in the hormones circulating in the bloodstream.

For example, there's decrease in the active concentrations of thyroid hormones, which are the hormones that really help to boost energy expenditure metabolism. There's increase in the amounts of stress hormones such as glucocorticoid circulating in the system.



There's decrease in the levels of active sex hormones circulating, and there's also decreases in the concentrations of insulin like growth factor in circulation with energy restriction. And all of these hormonal changes, actually if you take normal animals or normal human beings or healthy human being and you impose on them these kind of hormonal changes or you observe these hormonal changes, for example in menopause or getting older on a poor diet et cetera, they all contribute to increased fat mass, increased propensity to store belly fat or central adiposity. Decrease lean mass, decrease lean strength, and also decrease bone mineral density or content.

So, energy restriction does have effects on hormones and the reason why these hormonal changes are concerning is that they could potentially have an adverse effect on musculoskeletal integrity.

Slide 8: How does energy restriction impact upon musculoskeletal integrity in people who are trying to lose weight due to overweight or obesity.

[00:52:04] So the question is, well, how does energy restriction impact upon musculoskeletal integrity in people who are trying to lose weight due to overweight or obesity.

Slide 9: Effect of energy restriction on isokinetic knee extensor strength in people with overweight/obesity

[00:52:18] With my team at the University of Sydney we did some meta-analysis to try to understand this question. So we looked at all the literature where people had measured strength in our very controlled way. And we found that there was quite a number of people that had measured isokinetic knee extensor the strength using this kind of machinery in people with overweight or obesity during weigh loss diets.

Slide 10: Effect of energy restriction on isokinetic knee extensor strength in people with overweight/obesity

[00:52:48] And what we found, so each line on this meta-analysis forest plot represents the results from an individual study of people who were losing weight with either a moderately energy restricted diet or a severely energy restricted diet such as total meal replacement liquid diet.

And we found that overall, like there was some variability in the response but overall this document here shows that there was a significant decrease in extensor strength in people in overweight or obesity when they go on a weight loss diet. So that seems like a bad thing.

Slide 11: Effect of energy restriction on bone in people with overweight or obesity

[00:53:28] Looking also at bone, one of the factors of health is having a good musculoskeletal strengthening integrity so that you can plow through life and still be opening jam jars in your own kitchen when you are very old so. But if there's bone loss, too much bone loss, too much loss of bone density, then osteoporosis can happen, fractures, frailty, and being incapacitated.



Slide 12: Effect of energy restriction on hip bone mineral density (BMD) in people with overweight or obesity

[00:54:03] So we looked at the effects of dieting in people with overweight or obesity and the effects on bone. And looking at the meta-analysis results, so for example looking at six months or twelve months or twenty four months after the start of a weight loss diet, we saw that there were small but significant reductions in bone mass with dieting.

And these reductions in knee muscle strength or bone mineral density with dieting were roughly two to eight times greater than the amount of muscles or bone loss that people would be expected to lose with just aging. So there was some acceleration of muscle and bone loss with dieting in people with overweight or obesity, which is not good.

[00:54:58] So the question is, can it intermittent fasting reduce these effects of energy restriction or dieting on hormones and therefore reduce the effects on non-musculoskeletal integrity? So we know from mice studies that if a mouse is energy restricted, there's these changes in the hypothalamus of the brain for example, neuropeptide Y and all those neuropeptides which trigger hormonal responses, hunger, reduced energy expenditure.

We also know that if that animal is exposed to ad libitum access to food for just six to twenty four hours, then those changes in the hypothalamus of the brain are completely normalized.

[00:55:57] So this is being shown in mice, this is being shown rats, and it's also being shown in lean young men who show some similarities to mice and rats in terms of physiology and in terms of ... Obviously we can't look into the brain so easily with humans, but we can look into the hormones of people, and it's being shown during dieting that in the lean young men within 24 of ad libitum feeding, all of the hormonal effects of energy restriction are completely normalized.

Slide 13: Do intermittent fasting diets reduce the adaptive responses to energy restriction?

[00:56:44] So the question is, do intermittent fasting diets such as the diets that Leonie mentioned, do they reduce the adaptive responses to energy restriction in terms of the hormones and the hunger that result?

Slide 14: Molecular and Cellular Endocrinology

[00:57:01] So in 2015, we did a systematic review of the literature looking at the effects of intermittently energy restricted diet and looking at their effects on of course body weight and body fat loss and lean tissue loss. And also we were looking at the effects on hormones to see whether these diets, intermittent fasting diets have any differential effect on the hormonal response to dieting. In the literature, we found 40 publications at that time.

There were a number from Leonie but not including her new studies that she was talking about today, 40 publications. Most of these publications 31 of them involved intermittent



fasting type protocols such as the alternate day fasting or 5:2 type interventions or 1-7 days per week of severe energy restriction.

What Leonie was saying well is, intermittent fasting appears to reduce roughly similar effects as compared to continuous energy restriction to reduce body weight, fat mass, and fat free mass. We found that they seem to have roughly similar effects on glucose homeostasis, although Leonie's new studies are showing some really promising effects of intermittent fasting. We also showed that the intermittent fasting may reduce appetite compared to continuous energy restriction, and I'll come to that later.

But what we found is that it didn't appear to attenuate any of these hormonal effects of energy restriction. So whether you go on a diet and you do an intermittent fasting diet or continue say energy restricted diet, the results seem the same in terms of hormonal responses. So as Leonie said the intermittent fasting diet is a valid option. It doesn't seem better at least in terms of many aspects of weight loss, or of appetite control of glucose homeostasis, there may be some benefits.

Slide 15: Overview

[00:59:25] So, let's look at matching your diet to your biology and via the same weather of protocols for intermittent energy restrictions could be improved to actually result in better outcomes than the conventional diet.

Slide 16: To reduce adaptive responses to energy restrictions in human with overweight or obesity, time and complete restoration of energy balance are complete important.

[00:59:45] Now, I've shown you these adaptive responses to energy restriction mediated by the brain. So these include neuropeptide, changes in the hypothalamus, increased appetite, reduce energy expenditure, hormonal changes that tend to lead to lean tissue losses.

What we know from research is that if we want to reduce these adaptive responses to energy restriction, and if we want to reduce them in humans with overweight or obesity, which are quite different from mice and rats and lean young men, then there are two factors that are required and these are time, and these appear to be also a complete restoration of energy balance.

Slide 17: Time required for reduction of adaptive responses to energy restrictions in human with excess weight

[01:00:33] Let's look at the question of time. So here's some experiment and it's paramount, where resting metabolic rate also known as resting energy expenditure was measured in people with a body mass index in the overweight range and it was measured in energy balance before weight loss, and it was also measured during energy restriction.

Now, what happened is that in this experiment these people were then placed into energy balance again at the end of the energy restricted diet. In other words, they've gone on a diet, they had energy restriction to lose weight, they lost some weight, but then the researchers got



these people to eat some more so that they were eating the same number of kilojoules as their body was burning.

So they were in energy balance. And they found that after 10-14 days when it was measured again, they found that this reduction in resting metabolic rate was completely normalized. This was also shown in people with a BMI in the obese range, and that resting metabolic rate was here before weight lost. During weight loss resting metabolic rate reduced significantly, but after 10-14 days in energy balance or on a weight maintenance diet, where people were eating enough to maintain their weight, resting metabolic rate was normalized.

Similar outcomes can be seen when you look at thyroid function. So thyroid function is reduced by dieting but it's normalized after 10-14 days of energy balance at that lower weight. We don't know if it's reduced earlier than 10-14 days, but we do know that if a person is eating in energy balance for 10-14 days then that adaptive response will no longer be apparent even though they're still at a lower body weight.

[01:02:50] so time seems important, and the other factor that comes into that is also energy balance, ensuring that kilojoule intake is the same as kilojoule requirements for right maintenance.

Slide 18: In postmenopausal women with overweight / obesity

[01:03:05] Allow me to illustrate why I think achieving energy balance in intermittent fasting protocols is so important. So here's one example of a study in postmenopausal women with overweight or obesity. They measured a number of hormones in these women, and these hormones were related to the gonadotropic axis, so sex hormones.

For dieting, sex hormone levels are normal, like the baseline levels. These women were placed on a six month moderately energy restricted diet as well as exercise, which is what we call sensible diet and exercise, just what everyone tries to achieve. And what we say is these hormonal changes such as reduction in circulating levels of estrogen and free testosterone and increased circulating concentrations of sex hormone binding globulin.

What the SHBG does is it binds to those sex hormones and reduces their activity. So an increase in sex hormone binding globulin brings about a reduction in the amount of sex hormone that can float around and do its stuff. What they found is that if these women were placed on a 12-month weight maintenance program and they continue to lose a little bit of weight during that weight maintenance program, so the average over 12 months was about two kilos of weight loss.

What happened is that for as long as those women were on that weight maintenance program, they continued to show this reduction in estrogen free testosterone and increased sex hormone binding globulin. So in other words, these adaptive responses to energy restriction persisted for as long as these women were continuing to lose weight, although very, very slowly.



However, when they looked at separate women in that study who either maintained their weight or had small weight gain during the weight maintenance program. So in other words instead of losing a little bit of weight they actually maintained their weight or they gained a little bit of weight and the average was about a couple of kilos too. Then the sex hormone levels were completely normalized.

Slide 19: To reduce adaptive responses to energy restrictions in human with overweight / obesity, time and complete restoration of energy balance are complete important.

[01:05:44] From these types of studies and there's a few other studies around in the human literature, so it was saying that to reduce adaptive responses to energy restriction in people who have extra weight, it's important to spend enough time in energy balance in order to reduce those hormonal and metabolic effects of energy restriction.

Slide 20: The MATADOR Trial

[01:06:09] So to test this concept of a longer time in energy balance, an NHMRC funded study that was led by Nuala Byrne and that I collaborated in, we looked at using two week periods of energy balance to see if we could improve the outcomes from weight loss.

Intermittent energy restriction improves weight loss efficiency in obese men: The MATADOR Study

[01:06:35] So here's the published study. It was recently published in the International Journal of Obesity.

Slide 21: PROTOCOL DESIGN

[01:06:42] And here's just a snapshot of the protocol. So what we had, we had two groups of people, men. One group men was on a continuous diet and one group of men was on an intermittent diet. So this is Y axis shows the prescription for energy intake in terms of what people need to maintain their body weight. So let's start it off with a four week period where we gave them 100% of their energy requirements, so they maintained their weight during this time.

Then they went through 16 weeks of energy restriction, which is a moderate diet where they only receive 70% of their energy requirements and then they had a post diet energy balance phase.

Now in the men on the intermittent diet, they spent two weeks on a diet providing only 70% of their energy requirements, then they had two weeks on a diet providing 100% of their energy requirements. So it was a two week on off diet if you like, but the off period was not off the rails, it was off the energy restriction and eating about 100% of energy requirements for weight maintenance.



Slide 22: Intermittent energy restriction increases weight loss in men with obesity

[01:08:08] What we saw is that men on the intermittent diet lost significantly more weight than men on the continuous diet. So it was about 15 kilos as opposed to around 11 kilos of the 16 weeks of energy restriction. Also we know although the men on the intermittent diet they were dieting for around 30 weeks compared to 16 weeks in the control group on a continuous diet, we know that the greater weight loss in the men on the intermittent diet wasn't due to increased time on the weight loss program. Because this is looking at the weight loss in the men on the intermittent diet during every two week block on the diet.

So when they were in energy restriction shown by the black bars they were losing weight and when they were in energy balance in these two week period where they were prescribed a diet containing 100% of their calculated energy requirements. They weren't losing or gaining any significant amount of weight. So the intermittent diet was inducing greater weight loss for the same level of energy restriction. So if you like it's more bang for your buck in terms of the effort to lose weight and the weight loss result.

Slide 23: Intermittent energy restriction increases weight loss and reduces weight gain in men with obesity

[01:09:47] Intermittent dieting also reduced weight we gain in the men with obesity so even at approximately, almost six months after the end of the diet the men on the intermittent diet will still maintaining a significant roughly 13 kilo weight loss whereas men on the continuous diet had regained weight and they were at a weight that was no longer significantly different from their starting weight.

Slide 24: Intermittent energy restriction increases fat loss and reduces fat regain (with no greater lean mass loss)

[01:10:22] We also saw in this study that intermittent energy restriction increased fat loss and reduced fat regain with no greater lean mass loss. So even though men on the intermittent diet are losing significantly more fat than men on the continuous diet and keeping that off for longer, at least in this small study, they were losing no greater level of lean tissue. Which kind of evokes that idea that if we take a break from dieting maybe that might give some respite from the hormonal effects of dieting, which could potentially be beneficial in terms of protecting against the musculoskeletal effects of dieting. So this is looking like it would support that hypothesis.

Slide 25: Overview

[01:11:24] Okay, so that was matching your diet to your biology, and in brief the data is suggesting that having a longer time in energy balance would be important in terms of getting better outcomes from intermittently energy restricted diet. Looking now at appetite.

Slide 26: Molecular and Cellular Endocrinology



[01:11:56] Now in the systematic review that we did, we found that the intermittent fasting type protocols compared to continuously energy restricted diet, we found that they may reduce appetite. And Leonie's new data is also really honing in on this and showing that this is really a real phenomenon that could people.

Slide 27: Intermittent fasting may reduce appetite

[01:12:25] So in the 32 trials that we found in our systematic review that looked at appetite ... In the 32 trials that looked at intermittent fasting protocols, 10 of them investigated various aspects of appetite. For example, they asked people how hungry or satisfied they felt. We then measured food intake. So two out of these ten studies of intermittent fasting that measured appetite, they compared intermittent energy restriction or intermittent fasting against continuous energy restriction.

And both of these two studies showed that more people with intermittent energy restriction than continuous energy restriction protocols reported hunger or preoccupation with food, which doesn't sound like a good result in terms of appetite control but the results were very not low.

So the numbers were very low. So only 3% of people in the intermittent group were reporting hunger or preoccupation with food, although it was 0% in the continuous energy restriction group. Now, in two of these ten studies that compared intermittent energy restriction with a non-continuous energy restriction controller, so they had a control of some sort for example.

People were just told to leave their normal life as an example. So one out of two of these studies reported decreases from baseline in hunger and uncontrolled eating with increases in fullness, satisfaction, and restrained eating. And this was the same in the intermittent fasting group but not in the control group. And in the other study there was no difference from baseline in hunger, there was also an increase in fullness and satisfaction in the intermittently fasting group with no change in the control group.

So basically similar results. Six out of these ten studies of intermittent fasting that measured appetite, they compared intermittent fasting to baseline with no comparison group and they did have a mixed bag of results.

Slide 28: Intermittent fasting may reduce appetite (summary)

[01:14:45] So to sum it up, four out of ten trials showed that intermittent energy restriction increased appetite, although it was a small increase in appetite as seen in 3% of people as opposed to 0%. And four out of ten showed intermittent fasting decreased appetite and two out of ten show no significant effect on appetite.

But in balance this observation of either a decrease in appetite or no change in appetite compared to baseline before the diet in people on intermittent fasting is very important because it occurred despite significant weight loss in people on the intermittent fasting diet and significant decreases in leptin, which is a hunger reducing hormone.



So the fact that people are losing weight but they're not feeling hungrier than before the diet, or they're even feeling less hungry, that's significant in itself because conventional dieting is known to increase appetite.

Now Leonie has shown in her new study that increases in circulating concentrations of ketones such as Beta hydroxybutyrate and this was shown in five out of the six studies that measured ketones including some other studies. Two of the studies provided objective evidence of reduced appetite in response to intermittent fasting.

For example Leone's works showing that people just can't eat enough in order to overcome fasting and they still lose weight even though they're instructed to eat as much as they can to try and balance out the energy restriction that they have on fasting days. This is the evidence that the intermittent fasting is reducing appetite. The intermittent fasting appears to reduce food intake even after the fast day has ended.

There does seem to appear some advantages of intermittent fasting for appetite control although there is there's a lot of research to do to look at what might be the best types of interventions to reduce appetite with these protocols

Slide 29: Overview

[01:17:20] That was intermittent fasting and appetite. Now let's just look very briefly on how to eat less and stick at it. I will keep this section very short because my research is in hormones and brain neurochemicals and clinical trials and not so much on eating less and sticking at it in a practical sense because it's very hard and

I tend to look more at the ways that we can reduce the hunger that happens during dieting but there's a couple of things that could be helpful.

Slide 30: Meal replacement products can help with adherence and nutritional adequacy (notably protein adequacy)

[01:18:04] One thing that I would recommend during an intermittent fasting diet is to use meal replacement products in terms of helping with adherence and helping with nutritional adequacy. A number of researchers in the field are moving towards using meal replacements during intermittent fasting protocols. That's because it's just really hard to get all your day's nutrients into five hundred or six hundred calories worth of food especially for people who aren't dietitians for example. I think that is one option for improving nutritional adequacy during these diets.

Meal replacements have been shown to reduce the propensity to want to eat food because they take food out of the equation. Instead of chopping out a little tiny serve vegetables and tiny grams of fish or whatever you can eat on that yam, a meal and some program and then scoffing a few tablespoons of cream and thing. As you're preparing the food meal replacements just take that out of the equation, so that can be helpful.



Slide 31: Keep Busy

[01:19:30] Another thing that's important would be keeping busy. As a dedicated weight loss researcher I spend a lot of time doing market research on the various diets that we're testing in our research study. In the past five years we've done a lot of research on various forms of intermittent fasting. For example 5:2 type dieting, severely energy restricted diet, Ramadan fasting.

Some of the things I found most helpful was keeping super busy, keeping away from food. It was an amazing opportunity to do all those things I didn't really want to do other times like the tax return, cleaning out those kitchen cupboards, and scrubbing the back of them and also taking some walk over the beach. That was also good, or just walks in general.

But I have to say that I didn't really go hand in hand walking along the beach when I was intermittently fasting with my beloved because I was one of those probably three percent of people who get preoccupied with food when I'm fasting. I was told I was a bit snappy on the days of fasting. There are a lot of things you can do when you are fasting and keeping the focus off food is good.

Slide 32: Summary/Conclusions

[01:21:02] In summary hormones respond to fasting and famine, with intermittent fasting protocols with very similar responses as those staying in continuous energy restriction protocols. Unless we're talking about someone who has diabetes in which case or someone who has a propensity towards diabetes, in which case there may be some benefits of intermittent fasting, then it's really a case of picking the diet they prefer.

In terms of matching diet to your biology it would seem that spending time in a period of complete energy balance would seem to be important in terms of getting better hormonal responses from the diet, and better weight loss responses from the diet, and body composition responses.

Even if someone is doing an intermittent fasting day say two days fasting and five days feasting, having a complete break from that for a number of weeks would also seem in my view and based on the emerging research to be important.

Now paradoxically intermittent fasting does seem to appear to have some benefits for appetite management. That's something that's really worthy of research, and meal replacement products may be helpful to help people to stick with these diets. Certainly keeping a focus off food in whatever way that works is really important. Thanks very much for your attention and I'll return to you Matt.

[01:22:56.23] **Matt:** Thanks so much Amanda just let me presenter then I'll come back to my screen. That was amazing. That was making me think about all these detox stats and crush stats that are really sending people into this hormonal milieu that's working against them. The analogy I use is like put somebody in a Ferrari or a sports car inside, drive it a while and they lose control. That's really challenging.



Then your take on meal replacement is interesting as well because you might decide to eat food. If it is going to be a metabolic benefit then I have a stronger role and I can say that angle there as well. The question that I have for you is a bit lighter. This is for our discussion or after party coming up is that if you're in that three percent of people that doesn't do well fasting you get snippy or hungry as they say. Then how can we screen for those people, how do we know? I am just going to flag that question for the discussion and matching people up.

Session 4 – Intermittent dieting for athletes – Worth it, by Jackson Peos

[01:24:03] I am going to move on to our final presented here Jackson Peos who is going to look at intermittent dieting for athletes. I hope you can see in our presentations here that we're really looking to progress logically and really build on your knowledge and skills in these events as we go through. Jackson has a lot of credentials in terms of looking at athletic behavior. He's a rising academic star he's doing a PhD on this exact topic as well.

He's right at the coalface he's a competitive body builder and a physique coach as well. So he knows what people are doing to get those ideal bodies. He is a graduate in sports science in exercise and health care. Currently doing his PhD. at the University of Western Australia, and I can say he's a big brain already. I'm really excited to hear this presentation and know when I go to the gym this afternoon, should I be eating before or after? Should I have not eaten today, do I need a double tomorrow; am I going to get massive? Jackson that's going to be my key question for you. I'm just taking you off mute there and now I'm going to make you presenter and I'll confirm when you're up.

Jackson: Can you see my screen there?

Matt: Yes you're all up and going.

Slide 1: Intermittent Dieting for Athletes - Worth it?

[01:25:41] Thank you for that lovely introduction. I won't waste time talking about myself. I think you covered it well. I think we'll just go straight on to it. Leone and Amanda tackled some of that, more so health implications. I'm going to sort of focus more just on the body composition outcomes because that tends to be what I'm mostly concerned with when talking in the context of dietary strategies.

Slide 2: IF vs Intermittent Dieting

[01:26:16] They already talked about the definitions already, but I just want to cover a couple of points in terms of the definitions, and how they relate specifically to the fitness community. Because I still think there is some confusion there. Mainly because when people hear the term intermittent fasting or IF they might associate it with a number of different dietary strategies or approaches. In my experience what I find when I when I want to tell someone about intermittent fasting if they're in the fitness community.



They generally associate this with some sort of time restricted feeding approach so for example not eating two up to three pm or keeping all your meals within an eight hour window. But typically this is generally not what intermittent fasting refers to in the literature. In intermittent fasting research studies most of the time what they actually are actually referring to is one to seven days of severe dieting then alternated with a period of no dieting or maybe just a lesser amount of dieting sort of across the week.

Not some of the some of the popular methods we've already heard about from Leonie and Amanda that include alternate day fasting. So you've got twenty four hours of severe dieting, followed by twenty four hours unrestricted dieting. Then we've got the 5:2 as well which is two days of severe diet and then five days where the person will just self-select their diet. So when I hear the term intermittent fasting these are the sort of diets that I'm thinking about.

But like I said intermittent fasting protocols common literature, implement less than seven days of consecutive dieting before then increasing food intake for a temporary period. But recently we've seen some research that looks into intermittent that diet people for longer than seven consecutive days.

For example, dieting for two weeks straight before allowing participants to temporarily increase the caloric or energy intake. I'll talk about what the research is showing later on with some of these diets and provide some examples. But generally what we've me and Amanda coined this term but we've been referring them as longer form intermittent diets.

Some of the findings with these longer form intermittent diets have been pretty promising. Specifically it's my research that focuses on these longer form intermittent diets. In our lab we don't refer to these sort of diets as intermittent fasting per se as I think that term should be reserved for referring to the shorter term or short form intermittent diets like ADF which involves less than seven days of consecutive dieting.

Slide 3: Do athletes use intermittent dieting?

[01:29:31] So do athletes use intermittent dieting? I found it to be very common these days particularly among physique athletes and athletes that I work with as well. That would include bodybuilders or women's bikini athletes, or figure athletes. Anyone that is sort of preparing for some sort of contest that is judged based on physical or static appearance. I'm also finding that sort of intermittent style diets are starting to gain some traction among combat athletes. That would include boxers and wrestlers.

These sorts of guys make weight classes for their competitions. There's been a fair few higher profile nutrition coaches that advocate the use vitamin diets and they've be doing this for some time. I think that's probably the main reason why we're seeing obesity so prevalent in the fitness community particularly these days.

In these circles, in sort of fitness and body-building circles you might hear the term refeed or diet break thrown around a lot. Generally what these terms are referring is a light term that refers to this increase in food intake that would follow a period of dieting.



For example a bodybuilder might diet for two weeks and then now implement a three day refeed where they actually increase their food intake to three days before then getting back on to the diet. Sometimes this is to pre-determine the amount of eating and sometimes it would just be a period of unrestricted eating. Sort of go for feed or eat high for a feel low day as some people might say. I've heard of twenty four hour refeed periods going up to seven days or a whole week.

There's also a lot of debate regarding how frequently these refeed periods should be implemented during a diet. For example some nutritionists and coaches suggest that the refeed period should be implemented more frequently as an athlete approaches lower levels of body fat.

Where they are going to be more potentially susceptible to massive losses. Whereas you've got other coaches or nutritionists who sort of recommend a more consistent refeed schedule such as a one week refeed following every three weeks of straight dieting. Now in terms of the structure of a refeed.

Sometimes I can just involve the overall increase in food intake. So just increasing proteins, fats, carbohydrates all at once. Or can involve just increases in certain macronutrients for example giving preference to giving a big boost in carbohydrate intake, and leaving protein, and fat intake fairly consistent.

I'll talk about why an athlete might consider this as a strategy later on. From that you can sort of work out that we don't really have any specific guidelines on how to structure intermittent diets just yet specifically for athletes. This is largely because this method of dieting is still very new, and we just don't have enough literature looking at different intermittent diet protocols just yet. Sometimes why we consider putting an athlete on an intermittent diet in the first place, so what could be the potential benefits?

I think most of us would know that when we start a weight loss diet it's only really effective for a short period of time before our body adapts to it and we stop losing weight. This is because our body has a number of inbuilt mechanisms which Leone and Amanda talked about that tend to resist on going weight loss and try to keep us around a set point body weight and body fat level.

And in the research that is coined as adaptive responses to any jurisdiction and generally this is metabolic and hormonal changes that are going on. And a lot of these changes are complex and we'd need more than thirty minutes to go right into them. Just very briefly;

The adaptive response to dieting generally involves a slowing down of metabolic rate and a change in the levels of appetite hormones which cause an increase in hunger. I think most people are fairly familiar with that. Now the problem is; as the metabolic rate slows down we burn less calories when we're resting and when we perform an exercise. The less calories we are burning also means the less fat we are losing.

This means the longer that we diet the harder it actually becomes to aggressively lose more weight. And this response is often referred to as adaptive thermogenesis. In the athlete



specifically the research is showing that dieting also leads to a loss of muscle mass, muscle strength, decreases in performance. You can even get a slowing down of the reflex times.

We know athletes who diet tend to fall sick more often than athletes who don't diet so there's some sort of immune suppression going on. That's a sort of just a quick summary of some of the negative side effects that tend to accompany dieting. Fortunately what we know from the research is that many of these side effects are actually reversible. When someone goes back to eating normally for a period of time, metabolism tends to return to normal and hormone levels and appetite tend to normalize also.

Essentially the concept or theory behind intermittent dieting is that by bringing in these intermittent refeed periods or just temporary periods of increased eating within the diet we can offset some of these negative adaptive responses to any jurisdiction. In other words refeeds could potentially provide a metabolic boost or jumpstart that allows dieting if it is to be more successful in the long term.

We also know that as an athlete follows a diet, they tend to get a depletion of their muscle glycogen stores which has a flow on effect reducing their performance and also risks more loss of muscle mass and it's believed or proposed that refeed periods would replenish muscle glycogen stores and prevent an athlete's performance from becoming so negatively impacted as they are trying to lose weight.

So it's possible that an athlete's going to better maintain the training volumes and then perform better during competitions and probably lose less muscle in the dieting process by committing these refeeds.

I told you about some of the adaptive responses to dieting. They involve hormonal changes and one particular hormone that I'm more interested in than many others is leptin.

Now this hormone is responsible for regulating our metabolic rate and appetite levels. As we diet, we get a decrease in leptin levels in our blood which causes our metabolism to slow down and our appetite to increase which essentially makes dieting harder. And some cool research is showing that after just a twenty four hour refeed leptin levels can get a little surge and this surge caused a seven percent increase in our metabolic rate.

This is just temporary hence seven percent isn't huge but based on this study and some other acute research, it has led some people to believe that refeeds can cause just temporary elevation or boosting leptin levels which could play a role in reversing some of the negative side effects of dieting. So that's some of the potential physiological mechanisms that might be involved.

Just quickly, I will talk about some potential psychological benefits associated with intermittent diets which I think are worthy of mentioning mainly because any diet whether for a general person or athlete is only really effective if the person is able to stick to it. By implementing refeed periods it can sometimes allow the athletes to not feel so constantly restricted all the time.



I'm drawing from my experience from working one on one with athletes preparing for contests. They come to me for advice on weight loss intervention and things like that. But being on a diet for twelve weeks straight is hard and sometimes what we see is it just becomes too hard and an athlete might crack or be jilted or go off the wagon and they end up going backwards because of it.

So depending on the way you might set up an intermittent diet having scheduled refeed periods could mean that the athlete can go out for a meal with family or friends and not jeopardize your results and typically this doesn't carry the same feeling of guilt that you might get if you sort of have an unplanned binge you are unplanned deviation from the diet.

In my experience I found that if athletes on intermittent diets have something to look forward to in the form of a refeed at the end of the week or at the end of the month it tends to lead to them being more compliant during actual dieting periods. Sometimes this can just make the overall dieting process a little bit more enjoyable for them.

Slide 4: What does the research say?

[01:39:41] Probably based on what I've just talked about you might think that intermittent diet sounds so much better than your standard continuous or daily method of dieting but to be honest we don't really know yet.

There's been a lot of positive anecdotal reports amongst a lot of athletes and coaches who are the advocates of the use of intermittent diets and thus for their vast efficacy so just for example in a recent study here; they interviewed a number of body builders and they found that the use of intermittent diets was very common while losing weight in the lead up to competition.

Many of the guys reported the refeeds were beneficial for a number of reasons and just looking here this is an extract from the paper highlighted we just look at it quickly. You can see some of the things that the participants are reporting, hearing about that metabolic jumpstart and subjectively that some of the body builders reported sort of having more successful competition preps when refeeds were implemented versus when they weren't doing any refeeds.

And some of the benefits that we touched on before that replenishment of glycogen stores which might enhance performance. They also reported mental recovery and preventing sort of that regulation in energy expenditure or metabolism. Now obviously this is just subjective reporting and we can't conclusively take anything away from these data but it does hint that intermittent diets could be beneficial to athletes in my opinion anyway.

Now even though the use of intermittent diets or refeeds or how you want to term it is very prevalent in the fitness community and starting to see in many sports we actually don't have any scientific trials that have compared intermittent diet with a continuous diet in athletes and it's quite funny because it's been a diet sometimes seen as this sort of that scientific practice.



And people would talk about things like that adaptive mechanisms and leptin signaling and things like that but at this stage it's really all just based on theoretical principle. We really don't have the data just yet.

Slide 5: What does the research say?

[01:42:18] we don't have any research on athletes per se but we do have on overweight or obese people and this is mainly because these studies are easier to get funding for. Funding for anything related to the disease prevention for example obesity is a lot easier than getting funding for sports and exercise research.

And there's been a number of review papers recently published like the one Amanda touched on and so what these review papers do is they go find all the studies that have compared intermittent and continuous diets and then they bring them together and they say so what's the general trend what's going on.

The conclusions of the most of the authors have arrived that intermittent fasting so specifically intermittent diets that have less than seven consecutive days of dieting followed by a refeed period tend to not be any better than continuous dieting for the fat loss or muscle retention.

So the research hasn't really been that sexy or exciting when looking at intermittent fasting but like I said we have seen some promising results using these using some of the longer form of intermittent diets.

And recently in which was a pretty groundbreaking paper and it was really pumped out across a lot of the fitness body building YouTube's, Instagram's all those sort of channels what was the matador paper which Amanda was involved with and this was the one which had the overweight men and they dieted them but after every two weeks of dieting they put in a two week refeed period and I saw that the intermittent group; the group that was refeeding achieved a fat loss and didn't decrease their metabolic rate as much as a group that was just straight dieting the whole time.

In another study that Amanda didn't talk about. This one was actually using obese women I think it had seventy five women.

Of the six weeks, the women did a straight continuous diet or they did a six week intermittent diet where they would diet eleven days straight but then have a three day refeed to complete that formally period and they would repeat that three times. What they saw as an intermittent group lost more weight after the six weeks compared to the continuous group and maintained a higher metabolic rate.

Slide 6: What does the research say?

[01:44:57] Here are a couple of figures from the studies. I think we already saw this one before. This graph is from the matador and as you can see the intermittent diet group which is the solid black line lost more weight than the continuous diet group, which is that dotted line.



Slide 7: What does research say?

[01:45:15] This is from the study with overweight females and on the left hand side we have RMR which stands for resting metabolic rate and then on the bottom we have the six weeks of the diet. And the blue line is the continuous diet group and the red line is intermittent diet group, the group that was refeeding. As you can see, the blue continuous group decreases in metabolic rate more than the red intermittent group.

Remember that these studies use overweight people so we can't necessarily say that we would see the same sort of results in athletes because obviously these populations have very different metabolic profiles with one being typically sedentary, one with higher levels of activity, energy expenditure.

But I expect to see some positive results when we try our longer form intermittent diets in athletes because generally in physiology depending on the population we don't generally see a change in principles mainly like a change in directionality of the response. We see a change in magnitude most of the time.

Slide 8: The ICECAP trial

[01:46:27] Fortunately I will be conducting one of these longer form intermittent diet studies starting this year called The ICECAP trial which will be running the intermittent versus continuous energy restriction compared in an athlete population. I think this study is going to have a pretty large impact when it is published considering that intermittent diets haven't really been tested properly in athletes. So currently we are recruiting for this study because we only just registered it but we expect the start of the first batch of participants probably around June or July this year I expect.

So what we're going to do is take sixty athletes who have been doing weight training at least twice a week for the last six months; so fairly trained dudes. And we are going to allocate them to either intermittent or a continuous diet. The continuous diet group is to diet for twelve weeks straight and the intermittent diet group is going to do twelve weeks of dieting as well in total but after every three weeks of dieting they can have a one week refeed period where food intake is increased.

We're going to compare these two groups in terms of fat loss, how much muscle they retain during the diet and how the muscle strength is impacted and also you look at changes in metabolic rate and changes in levels of some of the hormones I talked about before such as leptin which regulates hunger and appetite as well as metabolism.

And one cool thing that we're going to do is we're going to measure metabolic rate and hormone levels before and after the refeed to see if it's actually true that the refeeds provide a metabolic boost and normalize some of these regulatory hormones that are impacted by dieting.

I think at this stage we don't really know what's going to happen but in my opinion based on the strong positive anecdotal reports and my sort of experience with implementing refeeding clients, I predict we are going to see greater fat loss and less reduction in metabolic rate in the



intermittent diet group. I also think that the refeeds are going to allow that intermittent group to train harder and maintain the training volumes in the gym during the diet and this is going to mean they retain more muscle mass and more muscle strength.

And one special thing about this study is that we're going to start with diet to see if the macronutrient targets because previously in some intermittent diets the studies have sort of had very general macro specifications or they might just provide a target number of calories with no macro breakdown but in our study we're going to be prescribing a specific high protein diet with low fat and moderate carbohydrate intake because we know from the research that the high protein diets reduce muscle losses during any jurisdiction and we know that carbohydrates tend to be more important than dietary fat for maintaining performance so this is sort of the reason why our choice to structure the dots in this way.

That during the refeed periods, the one week period in the intermittent diet group, protein intake, and fat intake is going to stay the same and we're going to give the participants a big boost in the carbs and we're doing it this way because there is some evidence that leptin gets more of an increase from carbs versus proteins or fats. It's also possible that the carbs are going to better replenish muscle glycogen stores and this is going to provide some form of benefits if the athlete trains during or immediately after a refeed.

Slide 9: Practical takeaways

[01:50:22] So, what could we take away from this? Well when we're talking about Intermittent fasting or I have thoughts of intermittent diets, I think we can pretty confidently say that they're probably not going to provide any benefits the fat loss or muscular retention over and above a calorie matched continuous diet at least in people with overweight or obesity.

Now some people might find that IF or intermittent fasting is easier to follow than a continuous diet for example on a five true diet I know some people that would prefer the diet aggressively for three days and then be a bit more relaxed during the rest of the week. So I think personal preference definitely comes into play a little bit when discussing which method of dieting is better so to speak because as I said before the successful weight loss diet ultimately depends on how well an individual can stick to it.

Now in terms of athlete specific concerns we didn't consider that most commonly intermittent fasting involves severe energy restriction for short periods and typically severe energy restriction is not advised or recommended for athletes as it's been shown in the research to result in greater reduction in performance and more muscle loss when compared to more of a steady rate of weight loss or motor energy restriction.

And I'll just touch on one study that springs to mind they took some elite athletes, I believe they were Olympians and they compared moderate versus more aggressive weight loss rates and one group lost 0.77% of their body weight per weight and another group lost 1.4% of their body weight per weight.



And what they saw as of the faster weight loss group actually lost more muscle and lost more bench press strength than the slow weight loss group. So, personally I wouldn't recommend any dietary protocol for athletes that involve severe energy restriction such as intermittent fasting protocols.

Now as we discussed with of course some evidence that longer form intermittent diets could actually be beneficial. Now these studies are for overweight people but nonetheless if I was an athlete beginning a weight loss phase. I think the longer form intermittent diet is a reasonable alternative to traditional continuous dieting. So for example an athlete might want to open with two weeks of dieting with two week refeed like they did in the matador trial.

And I want to confidently say that this type of intermittent diet would outperform a continuous diet but we don't have any data to suggest that the intermittent diet would be worse in any way. And so I think the absolute worst case scenario that an intermittent diet might provide is equal fat loss and muscle retention compared to the continuous diet but it could still possibly deliver some of the psychological benefits by giving the athlete a little mental break from dieting which might improve the athlete's mood and overall adherence to the diet.

So just summing up I definitely think an intermittent diet as a weight loss option based on the limited research we have but in the next couple of years as we publish findings from the ICECAP trial.

I also expect that just because refeed or diet break or intermittent diets becoming so popular and this is becoming so much talked about on social media and mainstream media and if this continues I expect we start seeing some more research resources allocated to running such sort of studies.

At a bare minimum we have to have the findings of ICECAP trial coming out in the next couple of years. I think then we should be able to speak more comfortably in terms of whether or not intermittent diets are better than your traditional continuous diets for athletes. So that's me, thank you for listening, thank you for your time.

[01:54:34] Hi, Jackson thanks so much for that. Very interesting once again and to get all the colloquial terms; diet break and refeed. You can imagine the numbers flying around the gym floor; two on, three off you know I'm eleven on, three and then it's a while. So what is the ideal there?

The other nice thing I thought was, you know, hearing stuff you know out of the corner of my ear in the gym you hear all these people giving advice and you know as we know it's a lot of pro-science and to put some real hardcore science on I'm really excited to hear the results that you're going to find out of this trial because that's going to give us that evidence that we do that's amazing and thank you.



Speaker Q&A

[01:55:17] I'm conscious of time and I'm going to jump straight into the questions here at the end. There are a couple of key things that I wouldn't mind knowing answers to and I'm just going to make myself presenter here as well and come back to the screen make sure all our.... I think Leone you've got your mute on, you may just need to click it off at your end because I can't change that. So let me just go forward to the questions here.

The first one going to, forward to, Yep you're all off mute now, is probably to Leonie. Just explain just a little bit on that longevity thing. I mean and I know this is going to be some of how does it apply to the consumer, how does it apply to clients. There are a lot of dietitians in the audience here just thinking. Do we have such questions with their clients; do you want to lose a bit of weight now or do you want to live longer? Should we be having these cost benefit discussions with our clients?

Leone: Yeah, and I know that the focus really needs to be on weight for a lot of these discussions I mean I think the focus should be on maximizing our health span and lifespan outcomes. If you're functional and able to... I'm not talking about the very top end where we're actually limiting movement and functionality. But if your BMI is twenty five or twenty eight... Do we need really need to be worried about the body weight question, and I think we should be talking about maximizing health outcomes.

I think it's important and I think that the intermittent fasting is already working in a number of cases now and then it is producing slightly better health outcomes for diabetes and cardiovascular risk. These are all short term acute studies and we don't know yet at this stage whether long term there is going to have those sustained benefits. But yeah if you can't stick to them it's kind of pointless as well.

We need diets that a sustainable that maximize health and maybe that question should really be not so focused on body weight because when you're losing weight invariably many people died that way.

Matt: That's true. This is I guess when somebody goes on that journey and they lose a bit of weight, start to get fit, nervously trying to hook them on fitness you try to hook them on healthy eating, potential mood impacts as well for that.

Amanda, one for you then; in a world where let's say people could have any biomarker tested you know whether it's leptin, whether it's blood sugars and thyroid might be easier also if you're on a plateau with something there. In terms of intermittent fasting then how would you match it for a client? What sort of things could you test for that could really match? What's going to happen in the future I guess because we're going to this world of personalized nutrition and sending us it off to get your genes tested, if you can just talk a bit about it in an ideal world with all this data.

Amanda: That's a great question Matt. So what we would want ideally is a biomarker, something that's going to objectively tell us whether somebody is having that adaptive response to energy restriction in which case it is a good wakeup call and it's a time to stop



trying to lose weight, let the body have a break given to energy balance. So that according to the research, the metabolic rate will come back to normal.

You also want to know when your body's not having that adaptive response because that's the time to really going to help a lever and try lose weight in that time because your body will be facilitating weight loss at that time rather than working against you.

Of all the different types of biomarkers, I think the thyroid hormones do show promise. There are some markers of thyroid hormone like some kind of spin off products from Thyroid hormone that may be of benefit and they can be measured in the saliva for further investigation. But what I like as a biomarker which is not entirely objective. That there's a level of subjectivity in there but that looking at the drive to eat.

We know that when people use a scale to measure how hungry they are we know that they show a change of that with the hormone levels. For example when they have been fasted or when they're dieted for a while they reliably show an increase in the drive to eat. When they have been overfed, they reliably show a decrease in the drive to eat.

In my research I'm working on using these and then the feeling of how Feeling of hungry you are as a marker of when it's time to diet and when it's time to back off and give your body a break.

Matt: That's sounds like a very easy thing for people to do in terms of that and I guess it might be linked into mindfulness and you know being aware of your mood and that sort of thing that's really good.

Jackson to you; what are the guys in the gym doing? What sorts of tests are they pricking their blood sugar every five minutes, or what are they doing with the spit in their blood?

Jackson: How I wish bodybuilders were that scientific and took that much care with what they were doing; a lot of rumors really if we're told about specific bodybuilders. A lot of things come from anecdotes. If we just can talk about the study that I referenced in my talk that asked the bodybuilders; do they use refeeds or intermittent diets and what do they think about them?

Like some of some of these body builders talked about refeeds attenuating the reduction in their metabolic rate or preventing metabolic downgrades. They have no way to know if that's really going on.

They have no way to know if their energy expenditure is being reduced or not. I feel like they had no objective measure to provide that comment so there's potentially the sort of these inbuilt beliefs and concepts that could be affecting things in the fitness community like having these guys believe that the intermittent diet or refeeds could be having all these physiological benefits even though the data doesn't really exist.

I tend to be a little bit skeptical sometimes just because of how little research we have. It's very hard to know whether like if I just draw on personal experience. I have done continuous



diets before and I've done refeed diets before and it's very hard to know physiologically the differences between each of those interventions that you go through.

Matt: I wanted to ask what works for you, what have you experienced?

Jackson: I definitely like doing intermittent diets and I definitely like them for my clients. I like them because of the psychological element. When I can say to an athlete every two weeks or maybe on each weekend we're going to give you a high calorie day we're going to eat more than you normally dieting days. I found that when I do that the athlete tends to just nail the dieting days during the week like they were not waived. They sort of have that short term end goal.

Matt: Yes, it sounds like it's flipping on to the concept of cheat meals which my feeling is I think I call them relax meals on the way because I want to relax with a glass of wine. Relaxing, maybe it's some weekend type of meals versus the normal nutrient rich maybe calorie restricted weekday meal for that. So it gives quite a positive and a metabolic spin on why somebody should have that treatment or whatever it's called.

Because of time I'm going to start to wrap up now but it's seems like it's going to be very interesting to watch this. I think some people that I have spoken to about this webinar beforehand say that intermittent fasting isn't the case that it's just about the sign. There's not enough interest in it to really look at it some more and I think if you like me watching this webinar it's probably spurk your interest a little bit more than maybe they hadn't before and I really encourage you to watch this space. Obviously I'll have updates in the future.

Because of time, and we always try to pack those webinars in with as much as we can and the speakers have absolutely done that. Thank you very much. I'm going to now wrap up the place.

Before you, in the audience there, before you run. I just want to appreciate you, thank you Leonie, Amanda and Jackson for their time today, and their preparation that's amazing. I want to thank Terence Tong who is a bit of a young superstar dietitian up and coming. He helps me out with some models including prep and follow up for the webinars. Also watch out for that name Terence Tong.

Before you do go make sure you tell us what you thought of fad or future. It's really important. There's an exit survey when you go out of the webinar. Please just take thirty seconds to say what you liked, what you'd like as a future topic and keep the discussion going. You're going to sit there and I think you're now very informed to actually educate somebody about intermittent fasting. I really appreciate that.

I'm going to thank our speakers finally; Leonie, Amanda and Jackson thank you. I'll check you very shortly for a follow up, and for everybody attending also you are the next fad or future. It's Matt O'Neill dietitian and director of the SmartShape center for weight management. Have a good day guys. Cheers.

[Audio ends @ 02:06:07]