



Intermittent Fasting

#FadOrFuture?

Speaker Summary Points

By Matt O'Neill, Founder of the SmartShape Centre for Weight Management

Here is a list of summary points I have made from the webinar. For each speaker, I've taken from the speakers' presentation. Some points are direct points made on slides and others are my interpretation or application of the content presented. This summary is not the exact words of the speakers nor is it necessarily endorsed by the speakers.

More than the 5:2 Diet – Variations & Evidence by Leonie Heilbronn

Caloric restriction

- Known from 1930s that caloric restriction (CR) increases lifespan in mice, flies, yeast, worms.
- Can't run lifespan studies in humans but we can look at biomarkers.
- Of two monkey colony studies, one has shown CR > lifespan so not sure yet?
- CR promotes metabolic health span, improves diabetes (better than metformin), improved CV risk factors & increases resistance to mild stress.
- T2D results when our system breaks down due to insulin resistance, which is characterised by fatty muscles, fatty liver and high BGL elevated by the foods we eat that produce glucose and overload the system.
- Is alternate day fasting (ADF) an alternative to CR? First mice study (Goodrick) from 1990s > lifespan benefits without a change in weight.
- Anson (2003) found ADF > sig improvement in insulin & BGL in CR or ADF mice but without weight loss in ADF mice.
- So, could fasting rather than weight loss > healthspan & lifespan benefits?
- In humans, Monks semi-fasted every other day with 1L milk + 500g fruit on fast day for 3 years > Less time in monastery infirmary & lived longer (but not sig).
- In our 2005 study ADF subjects couldn't eat enough on non-fasted days to maintain body weight. Saw increased free fatty acids (FFAs > burning fat effectively) & ketones when fasting.
- We also saw greater insulin sensitivity in men with ADF but not women (which is still being explored).

Definitions of IF

- Almost all mice & human studies have been on ADF.
- The Every Other day Diet (Valter) – ADF with up to 500Cal (~25% requirement) on fast day at lunch.
- The 5:2 Diet (Mosley) – Not much evidence & studies now just appearing.
- The 2 Day Diet (Harvie) - 2 days 500-600Cal then eat & drink normal for rest of week.

- Longo – 5 day consecutive fast (800Cal/day) then normal for rest of month > evidence for protection against cancer.
- And some Time Restricted Feeding (TRF) studies, e.g. Eat 9am-7pm so 14hr fast overnight.

Evidence in humans

- Varady studied m-ADF (500Cal on fast day), 8-12 weeks > 4-8kg loss, reduced T2D & CV risk, & reduced markers of oxidative stress (best measure F2 isoprostane in urine is a whole body marker)
- Different study - ADF vs CR over 12-months > Similar results. The ADF subjects tended to become CR pattern so ADF may be harder to adhere to.
- Harvie studied the 2-day diet Vs CR > body weight, fat mass & waist similar at 6-mths.
- Our study funded by NHMRC in 2014 wanted to know if weight loss was necessary – We had 4 groups; control, period fasting, CR (70% energy requirement) & periodic fasting at 70% energy.
- We found; IF a bit better for weight loss, periodic fasting subjects had trouble eating enough to maintain weight even if you give them enough food, & IF group lost more fat & muscle, so IF was not protective of LBM reduction.
- We also found for IF greater reductions in; HOMA-IR, LDL & FFAs.
- For perceived hunger, the IF was a bit higher at the start (not sig) & no difference by week 6.
- Study just out on 5:2 diet Vs CR – IF achieved weight loss faster but greater dropouts. Similar improvements in; insulin & BGL. But IF better for post-prandial TGs.
- Fasting mimicking diet in Australia as Prolon – Low protein for 5 days, then normal for month. Human studies coming out so mostly mice data > lowered inflammation, increased immunity, regeneration markers & lifespan.
- TRF studies are emerging (works in mice). Food intake typically backloads calories in the day so people are getting < 9hr fast which could be upsetting our circadian rhythm. Eating out of phase can shift our biological clock in the tissues (liver clock, muscle clock, insulin clock, etc). All this can change how we metabolise food.
- Evidence from mice shows TRF even on unhealthy food doesn't > poor metabolic health. Eating junk ad libitum does. In students on TRF, even the weekend off didn't have negative effect.
- Study of T2D subjects found CR diet eaten as breakfast + lunch Vs lunch + dinner > greater weight loss. So, breakfast may be important.
- We studied shift workers – Not eating at night maintained glucose tolerance, but eating at night > glucose intolerance next day.

Should I fast to live longer?

- If you are a mouse, yes. If you are a person, we don't know yet.
- IF reduces body weight & improves metabolic health markers, at least acutely.
- Long-term effects of IF in humans are still unclear.
- TRF might offer an alternative to strict fasting diets.
- I think the answer is that IF or TRF will definitely improve your health acutely & whether it's more effective than CR doesn't seem likely at this stage.

Your body on a fast – Individual responses by Amanda Salis

- I'll be looking at how hormones respond to fasting & how perhaps we can attenuate some of the effects of hormones to match IF diets.

How hormones respond to fasting

- ER induces adaptive responses largely mediated by the hypothalamic arcuate nucleus to counteract the ER, making it progressively more difficult to keep losing weight & having adverse effects on muscular skeletal integrity.
- Among other things, thyroid hormones fall & stress hormones increase.
- Muscle strength (knee extensor) reduces when overweight or obese people go on a diet.
- There are also small but significant reductions in BMD with dieting.
- Studies revealed losses in muscle & bone 2-8 times greater than by aging alone.
- Question is – Can IF reduce the effects of ER? In animals just 6-24hrs of ad libitum food intake can normalise changes in hypothalamus & brain.
- Our 2015 systematic review didn't find that IF attenuated the hormonal effects of ER.

Matching diet to biology

- If we are to reduce the adaptive responses we need complete restoration of energy balance.
- One study induced weight loss with CR & then adjusted EI to maintain energy balance at new lower weight for 10-14 days then retested > adaptive responses no longer there.
- In postmenopausal women with overweight / obesity, those who maintained or gained a small amount of weight (after initial weight loss) returned sex hormone function to baseline. Those who continued to attempt to achieve weight loss (although slowly) did not. Time in energy balance is also important.
- To test the concept of longer time in energy balance (EB), the MATADOR Study (Minimizing Adaptive Thermogenesis And Deactivating Obesity Rebound) by Byrne that I collaborated with compared men for 16 weeks after 4 weeks on EB:
 - Group 1 – Continuous CR diet of 70% Cals
 - Group 2 – Intermittent diet of 70% Cals 2 weeks on & 2 weeks off.
- Results – IF lost more weight (16 Vs 11kg) of which the weight loss accumulated through the CR IF phases. Also kept the weight off (13kg) Vs total average regain for CR group. IF Group also greater fat loss with no additional muscle loss.
- So, taking a break may give some respite from the hormonal effects of dieting.

Is IF compatible with appetite management?

- Our systematic review found that 10 of 32 studies investigated appetite. The results are a mixed bag.
- 4/10 showed a small increase in appetite (3% Vs 0% in small numbers), 4 /10 a decrease & 2/10 no change.
- On balance a decrease or no change in appetite is very important because it occurred despite sig weight loss on an IF diet & sig decreases in leptin, which is a hunger-reducing hormone.
- Leonie's studies related to ketones & inability to eat enough on non-fasting day provide evidence that IF reduces appetite & food intake after the fast day has ended.
- So there does appear to be some advantages of IF for appetite control, although there is a lot of research to do on what might be the best protocols.

How to eat less and stick at it

- I would recommend meal replacements during an IF diet to help with adherence & nutritional adequacy.
- Meal replacements take food out of the equation.
- Keep busy & away from food as I'm one of those probably 3% of people who get preoccupied with food when I'm fasting.
- Unless we're talking about someone with or a propensity towards diabetes, in which case there may be some benefits of IF, then it is really a case of picking the diet they prefer.
- In terms of matching a 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, weight loss & body composition responses from the diet.
- Even if someone is doing a 5:2 diet, having a complete break for a number of weeks would also seem important.
- Paradoxically, IF does seem to have some benefits for appetite management.

Intermittent dieting for athletes by Jackson Peos

- IF can mean a range of things in the fitness community.
- IF is generally associated with some sort of time restricted feeding approach within a day & not what the research has been studying > commonly 7 days or less of consecutive dieting followed by an increased food intake for a temporary period.
- But recently research has looked at intermittent dieting (ID) that people do for longer than 7 days, e.g. 2 weeks then refeeding > longer form ID.

Do bodybuilders & fitness goers use IF?

- Very common in physique athletes. Starting to gain popularity in combat athletes.
- Refeed periods and diet breaks (24 hr, 48 hr, 1 week).
- Positive anecdotal reports among athletes of refeeds for a "metabolic jumpstart".
- Some focus on carb refeeds to boost muscle glycogen.
- It's possible that athletes could better maintain training volumes.
- And it's hard to maintain a strict training diet for say 12 weeks, so there may be psychological benefits.
- May have social benefits too, like looking forward to going out with family for a meal.
- But controlled scientific trials are lacking in athletes.

Research on IF for fat loss & muscle gain in athletes

- IF fails to outperform continuous dieting in terms of fat loss or muscle retention in overweight populations.
- Some evidence shows benefits of using longer form intermittent diets in overweight populations (MATADOR Study), particularly greater weight loss without as greater drop in metabolic rate.

The UWA intermittent dieting study in athletes

- I will be conducting a longer form intermittent diet study starting this year called The ICECAP trial which will be running the ID Vs continuous CR in an athlete population.
- We will have 60 athletes (weight training at least 2/wks for 6mths) >
 - Intermittent diet – 12 wks straight
 - Continuous diet – 12 wks dieting but with 3 wks on, 1 wk refeed
- We'll compare; body fat, muscle mass / strength, metabolic rate & hormones (e.g. leptin)
- We'll check if the refeeds increase metabolic rate & normalise regulatory hormones.
- I predict we'll see greater fat loss & less reduction in metabolic rate in the ID group. Also that refeeds will allow the ID group to train harder > retain more muscle mass.
- We're starting with a very specific macronutrient ratio (high-protein, low-fat & mod-carb) as we

know this combination tends to be better for muscle mass & performance.

- The refeeds will give a big boost of carbs, maybe to provide a benefit immediately after a refeed.

Practical applications of intermittent dieting for athletes

- IF fails to demonstrate benefits compared to continuous dieting when calories are matched.
- May facilitate adherence & mood.
- IF could potentially be detrimental to an athlete's performance.
- Longer form ID may have some benefits over continuous CR.
- Worst case scenario ID provide psychological benefit and mental break
- I definitely think an ID as a weight loss option based on the limited research we have.
- When 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 ID are better than your traditional continuous diets for athletes.

Speaker Q&A

Matt: Regarding the evidence for longevity, should dietitians be having discussions with clients about whether clients want to lose a bit of weight now or do you want to live longer?

Leonie: I know the focus needs to be on weight for a lot of these discussions. But if BMI is 25 or 28, do we really need to be worried about the weight question? I think we should be talking about maximising health outcomes.

Matt: 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?

Amanda: ideally is a biomarker, something that's going to objectively tell us whether somebody is having that adaptive response to energy restriction. Of all the different types of biomarkers, I think the thyroid hormones do show promise.

But what I like as a biomarker which is not entirely objective. That there's a level of subjectivity in there but that is looking at the drive to eat. The feeling of how 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: What are the guys in the gym doing? What sorts of tests are they pricking their blood sugar every five minutes?

Jackson: How I wish bodybuilders were that scientific. 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.

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

Jackson: I definitely like doing ID and I definitely like them for my clients. I like them because of the psychological element.

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