Clarice Hebblethwaite

NZ Registered Dietitian

NZ Dietitians Gastroenterology Interest Group, Christchurch

Saturday, August 13, 2016

(Room 8)

8:30 - 9:25 WS #67: Eating Your Way to A Baby

9:35 - 10:30 WS #77: Eating Your Way to A Baby (Repeated)

Eating your way to a baby
Nutrition for fertility

Clarice Hebblethwaite
Dietitian and Nutritionist
Dietary Specialists
Christchurch

Infertility

- Not being able to conceive after one year of unprotected sex
- Affects 186 million people worldwide
- Male infertility accounts for 50% cases

Overview
Nutrition and Fertility links

- Weight – under / overweight
- Hormones
  - Insulin
  - Adipokines – Adiponectin and Leptin
- Dietary Fats
- Carbohydrates
- Proteins
- Vitamins and Minerals
- Heavy metals and Pesticides
- Caffeine
- Alcohol

Overview
Dietary approaches for fertility

- Obese / strong insulin resistance BMI 30+
- Overweight BMI 25-29
- Normal weight –no insulin resistance
- IBS/ Endometriosis

Weight – Underweight < BMI 20

- 4 fold longer time to pregnancy
- 29 months vs 6.8 months to conceive

- Reasons
  - Low % body fat = amenorrhoea
  - Excess physical exercise to exhaustion
    1 hour, 4 times+ per week
    - 2.3-3 fold increased risk infertility
    - INDEPENDENT of fat stores

Weight- overweight

- Women
  - Obese BMI >29.9 have 2 x increase risk of Ovarian disorders
  - If ovulating but sub fertile spontaneous conception **decreases** by 5% for each BMI unit > 29
  - ↓Oocyte quality & uterine receptivity
- Men- weight has less impact on fertility
  - Overweight lowers sperm count but unrelated to sperm motility

Insulin

- Controls glucose uptake and oxidation and storage
- Stimulates glucose uptake by skeletal muscle and adipose tissue

Insulin

- Insulin resistance ~ impaired metabolic response to insulin
- Insulin resistance (IR) in <30% overweight
- Polycystic ovarian syndrome (PCOS)
  - Selective IR also occurs on ovaries
  - Hyperinsulinaemia = potentiates ovarian androgen production

  = inhibits hepatic synthesis of

  sex hormone binding globulin (SHBG)

  = elevated free testosterone

Adipokines- Adiponectin

- Adipose tissue an ‘endocrine’ organ regulating energy homeostasis producing adipokines include
  - Adiponectin, Leptin, IL-6, TNF-α
- Adiponectin~ **Low levels in obese**
- Is insulin sensitising, anti - atherosclerosis, anti inflammatory
- Has insulin like effects on tissues
- Involved in pre implantation, embryo development & uterine sensitivity

Adipokines- Leptin

- **Leptin resistance in obese**
- Produced in adipose in proportion to stored Triglycerides
- It should reduce food intake, regulate pancreatic islet cells & fat stores
- Leptin resistance = dysfunctional energy state, interferes with oocyte maturation

Dietary Fats

- Omega 6: Omega 3 ratio
  - 1:1 in primitive diets
  - 25:1 in modern diets due to cooking oils
  - Omega 6 = pro inflammatory prostaglandins PG 2 series (effects Endo)
  - Ratio important for reproduction incl. GnRH, LH
- Trans fats from processed vegetable oils – turned into a solid fat
  - margarine, muesli bars

  = Ovulatory infertility, increase IR

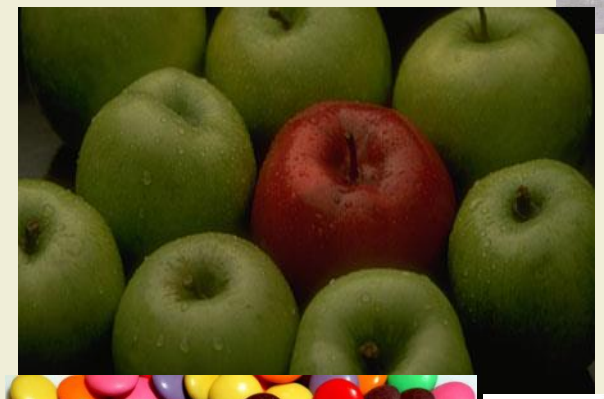
The rise of omega 6 and Trans fats

- And fall of omega 3 fats

Carbohydrate rich foods



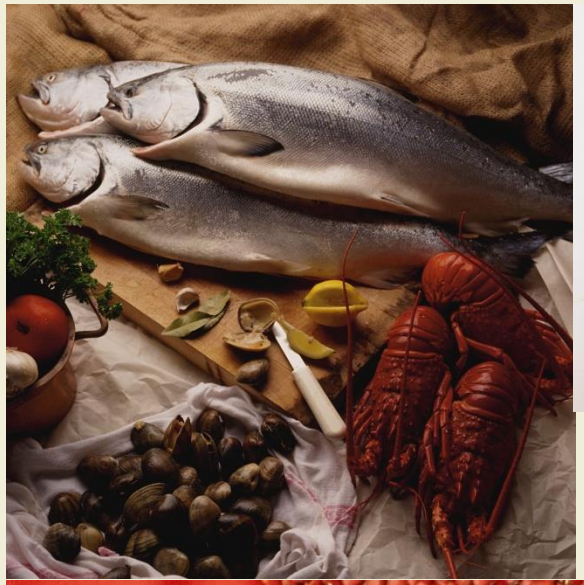





Carbohydrates

- Main effect is mediated by insulin
- High intake of Carbs a problem in Insulin resistance (IR)
- IR influences dyslipidaemia, hormonal and ovulatory effects

Protein Rich Foods



Protein rich foods

- In PCOS with IR
  - Protein in place of carbs

    = improved menstruation, reduced

    androgen levels & weight loss
  - Nb protein intakes of >30 g protein per meal (120g chicken) = insulinogenic
- Animal proteins vs Plant proteins
  - Higher intake of animal proteins = ovulatory infertility via insulin secretion and IGF-1
  - Adding 1 serve meat /d = 32% ovulatory infertility

Vitamins and minerals

- Women
  - Taking multivitamins may have less ovulatory infertility
  - Iodine vital for T3 / T4 production and preconception
- Men
  - fruit and vegetables improve semen quality via fewer free radicals
  - Vitamin C and E supplements improved semen quality

Heavy Metals and Pesticides

- Heavy metals e.g. lead, mercury, aluminium, cadmium, arsenic, antimony
  - Lead decreases female fertility, alters sperm quality
  - Mercury disrupts spermatogenesis and foetal development
- Pesticides on fruit and vegetables
  - endocrine disruptors, mimic natural hormones, poorer semen quality

Caffeine

- Caffeine
  - > 500 mg / d increased time to pregnancy of 9.5 months+
  - Caffeine > 100 mg /d increases spontaneous abortions
  - 1 shot espresso 80 mg
  - 1 instant coffee 50-80 mg
  - 1 tea 55 mg
  - 250ml energy drink 120 mg
- Max 1 single shot espresso per day

Alcohol

- Men
  - Testicular atrophy, lower libido, decreased sperm count, reduced semen volume, altered sperm motility
- Women
  - Hangover associated with ↑infertility
  - Ranges from 1-5 standard drinks/d increase time to pregnancy,

    decreasing conception rate by 50%,

    ↓ implantation rate & ↑spontaneous abortion

Dietary Approaches for fertility

- So what to eat???

Diet for the BMI ≥ 30
Primary Goal ~ Weight Loss

- Weight loss surgery most effective
  - > 30% of excess body weight loss in 6 months after sleeve gastrectomy or gastric bypass
- Diet and Exercise
  - Goal: reduce hunger and cravings
  - For best success - reduce Insulin levels
  - Are they Insulin Resistant i.e. not handling carbohydrates well ?

The Carb tolerance test (WTF)

- **1 not true, 2 seldom true, 3 occasionally true,**
  4 mostly true, 5 definitely true

1. Dieting is hard for me as I get so hungry
2. I often feel hungry that I have to eat something
3. I have a sweet tooth
4. I easily gain weight and mostly around the torso
5. I struggle to lose weight and keep it off
6. Once I start eating carbohydrates I get hungry soon after
7. I always eat all the food on my plate and often seconds
8. When I'm hungry I crave carbohydrates- sweet or savoury
9. I have close relatives with diabetes or heart disease
10. I am often tired and feel sluggish to exercise
11. I am quite overweight even though I have dieted often
12. I have pre diabetes or diabetes

The Carb tolerance test scores

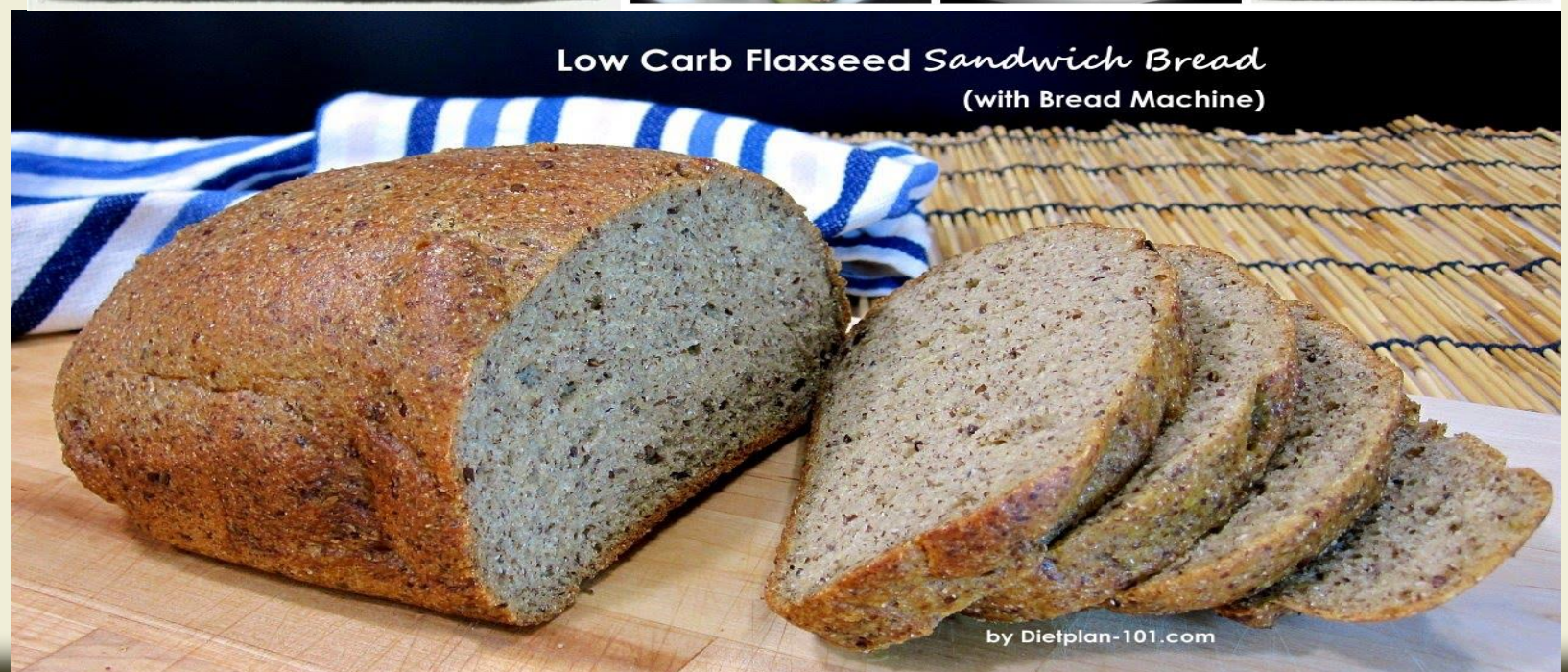
- 12-27 - Highly carbohydrate tolerant and can choose where to set your carb limit
- 28-43 – may have some carbohydrate intolerance / mild insulin resistance so could benefit from some reduction in proportions
- 44-60 you are most certainly carbohydrate intolerant i.e. your body does not handle carbohydrates well & likely to have strong insulin resistance

Diets for strong insulin resistance

- Low carbohydrate high natural fat (LCHF)
  - No grains, potato, kumara, fruit
  - Moderate amounts of protein – 120g meat or chicken or fish per meal
  - High natural fat e.g. 2TBS fats / oil /½ can coconut cream / cheese/ cream per meal
  - 3 meals each day
  - Ketogenic (under 50 g carbs) or low carb 50 – 100 g per day
  - “What the Fat” by Prof Grant Schofield


ketodietapp.com


LCHF Salad Ideas
Ditch the Carbs


Low Carb Flaxseed Sandwich Bread
(with Bread Machine)
by Dietplan-101.com

Diets for strong insulin resistance

- Paleo diets
- Very similar to LCHF
  - A few to several g carbs - not ketogenic
  - No grains or potato but includes some kumara & limited fruit
  - Often dairy free
  - “Family Food” “Going Paleo” Pete Evans


Paleo Granola
By Eat Drink Paleo




Diets for BMI 25 -29
Primary goal ~ weight loss

- Moderate carbohydrates ¼ plate
- Moderate protein 80 - 120 g meat/meal
- Low healthy fats at 1-2 tsp per meal: olive, avocado, nuts, seeds, a little organic butter
- High in vegetables ½ plate ~6 cups/d
- Some fruit < 2 x day
- ‘Real Food Kitchen’ and ‘Real Food Chef’ by Dr Libby Weaver

With option of FASTING

- Intermittent fasting
  - Eat within 8 hour window each day e.g. 10 am to 6 pm
- Regular Intelligent Fasting
  - Reduced calorie intake e.g. 500 cals/d
  - 2 or 3 non consecutive days per week
  - ‘The Fast Diet’ by Dr Mike Mosley
- Effects:
  - Lowers IGF-1, inflammatory symptoms, glucose, insulin, cholesterol, weight
  - Sustainable & less depriving for many

Diet for normal weight & fertility

- High plant based diet
- ≥ ½ plate of each meal vegetables
  - Aim for 6 cups per day
  - 50% of vegetables raw leafy greens and broccoli
- ≤ ¼ plate carbohydrates wholegrains
- ≤ ¼ or less plate proteins
  - More vegetarian choices of legumes; chickpeas, lentils, kidney beans etc, nuts, seeds, tofu, tempeh, sprouted beans

Fibre, antioxidant, mineral rich Vegetables

Diet to maintain healthy weight and boost fertility

- Some fat healthy choices
  - Fewer omega 6 and & low trans fats from processed foods ~avoid most vegetable oils*, margarine, bought muesli bars, crackers and biscuits, fewer takeaways

  * have cold pressed oils and don't let them smoke
- More omega 3 fats
  - walnuts, linseed, small oily fish (sardines, anchovies)
- Intermittent fasting / nutritional fasting
- Avoid plastic packaging
  - Drink from metal drinks bottles Avoid plastic on food
- Buy organic or wash fruit and vegetables in ¼ vinegar and ¾ water to wash off sprays

Vitamin Mineral supplements

- Spirulina
- Barley grass juice extract powder
- Go Healthy Go Multi
- Clinicians vitamin mineral boost
- Solgar V2000
- Elevit
- Key nutrients: iron, B vitamins include B6, Folic acid, C,D, E, iodine, selenium, zinc

Wanting to conceive but have IBS or Endometriosis ?

- Identify food intolerance
  - Check for coeliacs
  - Breath testing for fructose and lactose malabsorption
  - Elimination diet trial e.g. Low FODMAP
- Constipation or PMS
  - + Magnesium
- Elevated histamine
  - + Vitamin B complex and Vitamin C

Activities

- Avoid regular excessive exercise to exhaustion; 1 hour > 3 times weekly
- For weight loss high intensity interval training (HIIT)
  - 3 times weekly - Warm up first
  - 20-30 seconds of ‘as fast as you can go’ then 2-3 minute recovery x 3
- Strength training e.g. weights, yoga, pilates
- Restorative activities e.g. meditation, tai chi, restorative yoga, walking in nature

Summary of nutrition for fertility

- Obese BMI ≥ 30 No.1 goal weight loss
  - Weight loss surgery? For yo-yo dieters or
  - Low carbohydrate moderate-high fat diet &
  - Frequent meals – may need snacks
- Overweight BMI 25 -29 goal weight loss
  - Moderate carbohydrate high plant diet &
  - Daily intermittent fasting 10am to 6 pm

    or 2-3 days per week 500 calorie diet
- Healthy weight
  - High plant diet, vegetarian meals, more omega 3s, organic foods, multivitamin mineral,

References

- Fontana.R, Della Torre, S..The Deep Correlation between Energy Metabolism and Reproduction: A View on the Effects of Nutrition for Women Fertility Nutrients. 2016 Feb; 8(2): 87

- Shaume.K, Plotsky.AJ. Nutrition And Reproduction: Is There Evidence To Support A “Fertility Diet” To Improve Mitochondrial Function? Maturitas 2013 Apr. 74 (4) 209-312

- Gormack.A, Peek.J, Derraik.J, Gluckman.P.D, Young.N.L, Culfield.W.S
  (New Zealand Study) Many women undergoing fertility treatment
  make poor lifestyle choices that may affect treatment outcome.
  Hum Reprod 2015 Jul;30(7):1617-24

- Sharma R, Biedenharn K et al Lifestyle factors and reproductive health;taking control of your fertility. Reprod Biol Endocrinol. 2013; 11: 66.

- Hamzehgardeshi.Z, Shahhosseini.Z, Shamdee.K. Lifestyle and outcomes assisted reproductive technniques;A narrative review Glob J Health Sci 2015 Sep; 7(5): 11-22


Time to
breathe, rest and reston