The Freshwell Low Carb Project: A Metabolic Health Toolbox

Freshwell
LOW CARB PROJECT

QISMET CERTIFICATED



Dr David Oliver

GP

Declaration of Interest

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A Director of Freshwell Project CIC

- Community Interest Company
  - Book sales, donations, no personal income

- Grant from Essex CC Public Health
  - Funding the time that we're spending on research

Freshwell Low Carb Project

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- NHS GP for 25 years
- Dr Kim Andrews & Dr David Oliver
- 17 Years of failure with lifestyle advice
- Focus on metabolic health & low carb for 8 years
- Life changing for us as GPs & our patients



Overview

Freshwell
LOW CARB PROJECT

1. Insulin resistance, hyperinsulinaemia & metabolic syndrome
2. What advice we give patients
3. Freshwell resources – free to share
4. Common concerns about low carb

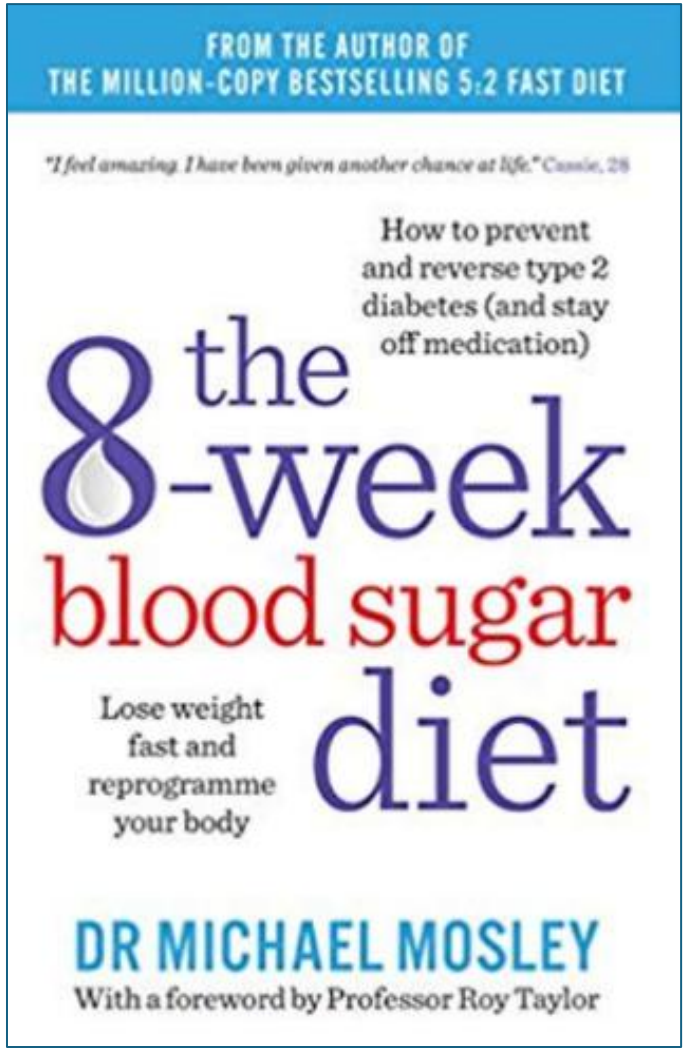
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Where We Started

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Case History 1 – Kim's Dad

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- Overweight for decades
- Multiple diets
- Pre-diabetes
- BP meds

Case History 1 – Reversal of Pre-Diabetes

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- 4 months later
  - 23kg weight loss
  - Pre-diabetes in remission
  - Off BP medication

Case History 1 – Kim's Dad

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- Sustained for 6 years
- 27kg weight loss

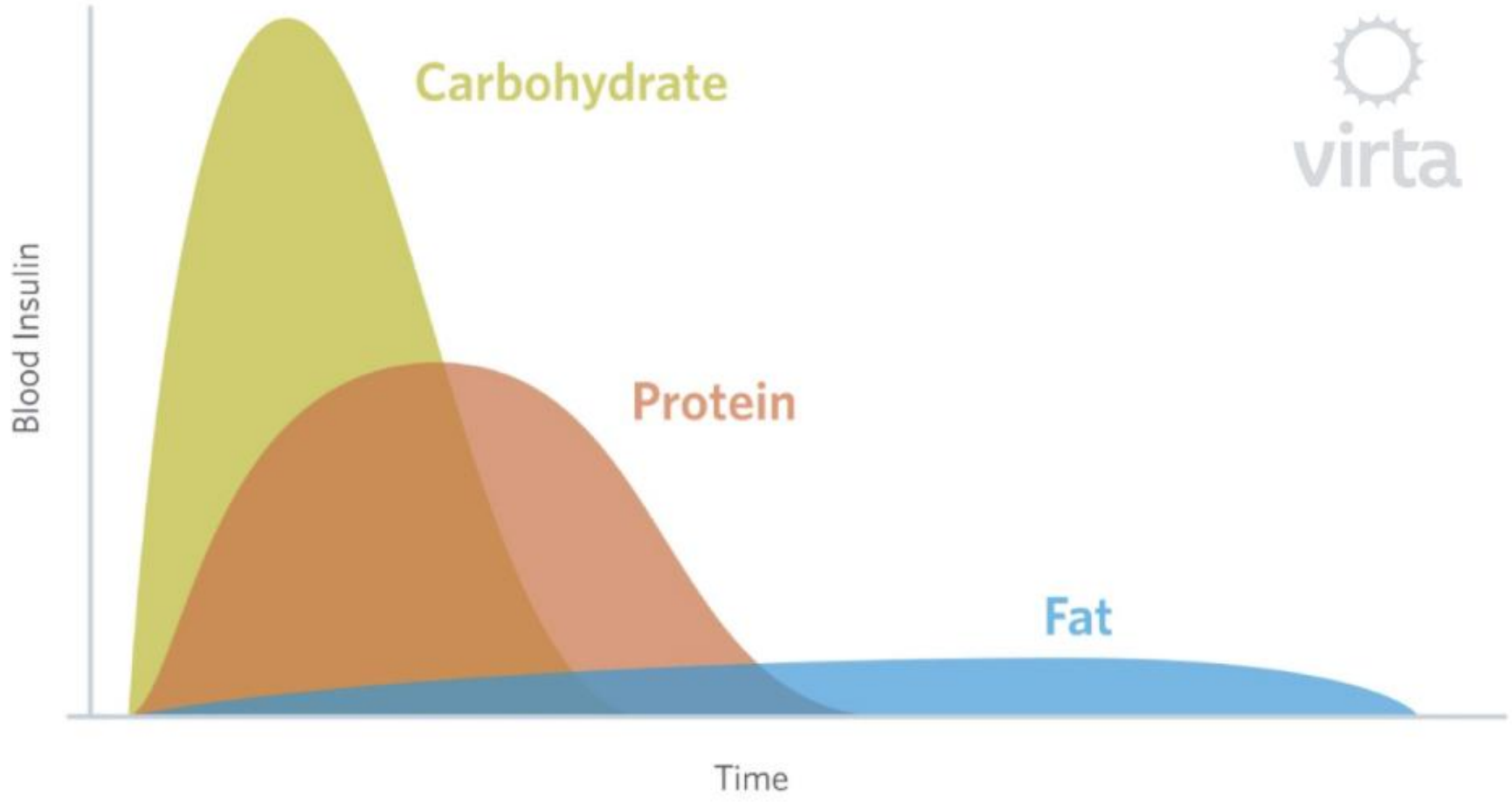
Down a rabbit hole



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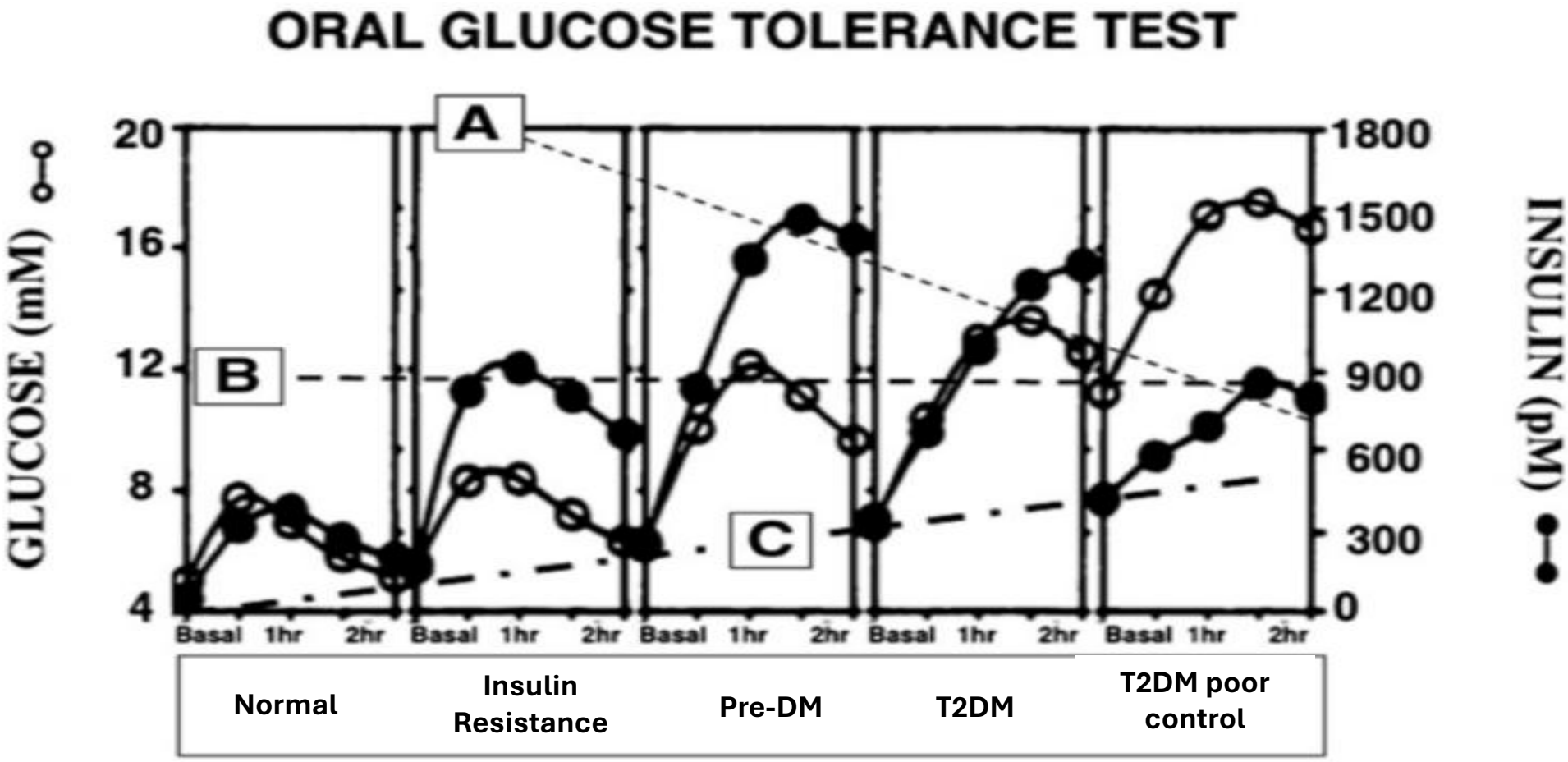
Insulin response to macros

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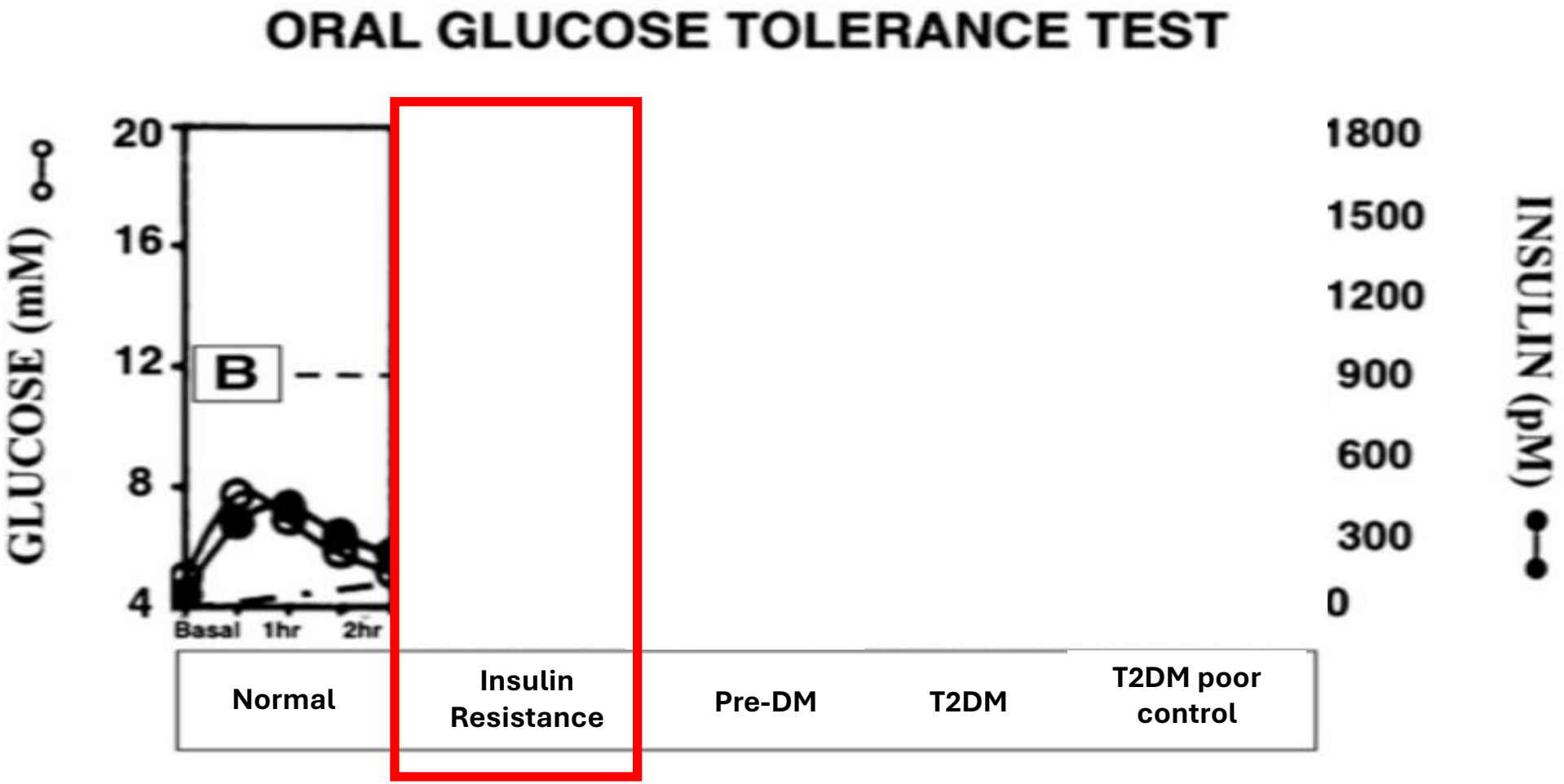
Hyperinsulinemia & Insulin Resistance

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Hyperinsulinemia & Insulin Resistance

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Metabolic Syndrome

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- **A clinical diagnosis** based on a cluster of three or more measurable **CVD** risk factors
- **Insulin resistance** is the primary driving mechanism, which is not directly measured

Marker	Risk Factor
Waist circumference	↑
Triglycerides	↑
HDL	↓
Blood glucose	↑
Blood pressure	↑

- "Normal BMI" incidence of multiple metabolic abnormalities 25%

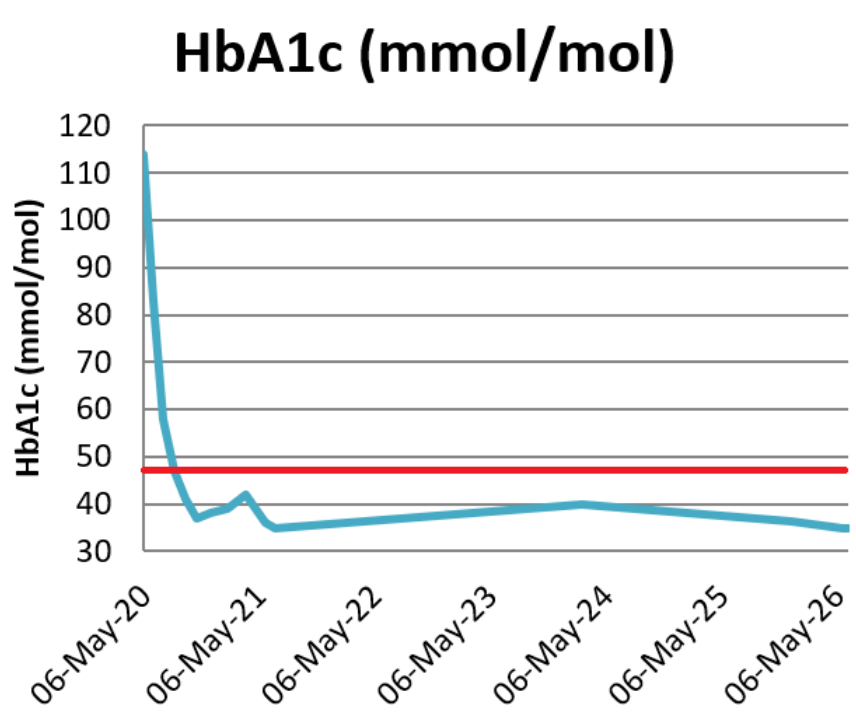
Case History 2

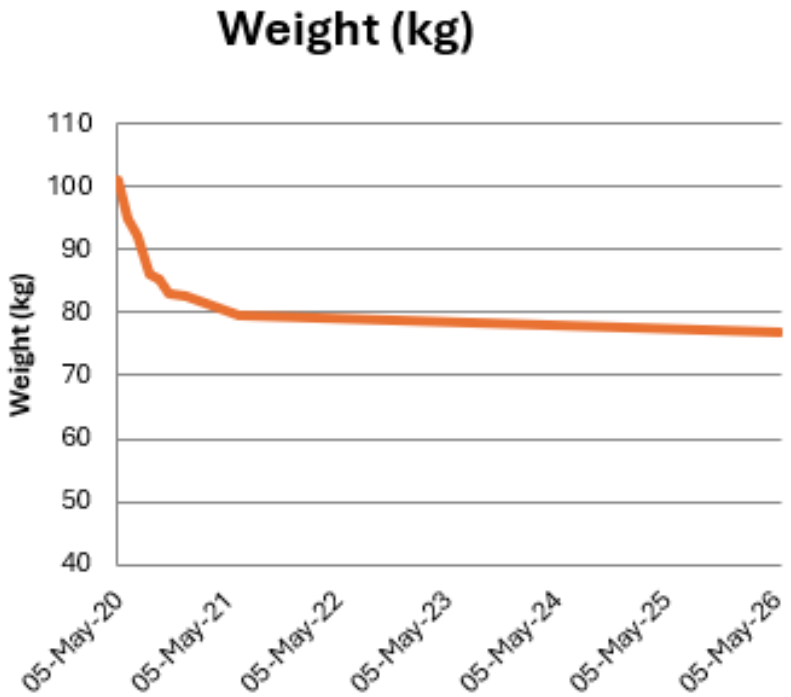
- Male, early 50s, early 2020, lockdown
- Acute abdominal pain
- Weight 101kg, **central obesity** (BMI 32)
- Non fasting BM = 19
- HbA1c = 114 mmol/l – **T2DM**
- Triglylcerides 4.2 mmol/l
- ALT 66, GGT 71, likely fatty liver
- Tired, otherwise asymptomatic
- Diet “healthy” – wholegrains & fruit. Little UPF
- **Plan?**

Case History 2: Weight & HbA1c

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- He chose low carb lifestyle, no medication
- HbA1c 114 -> 47 in 3 months (latest 35) – T2DM remission
- Weight loss 33lb (15kg) in 3 months

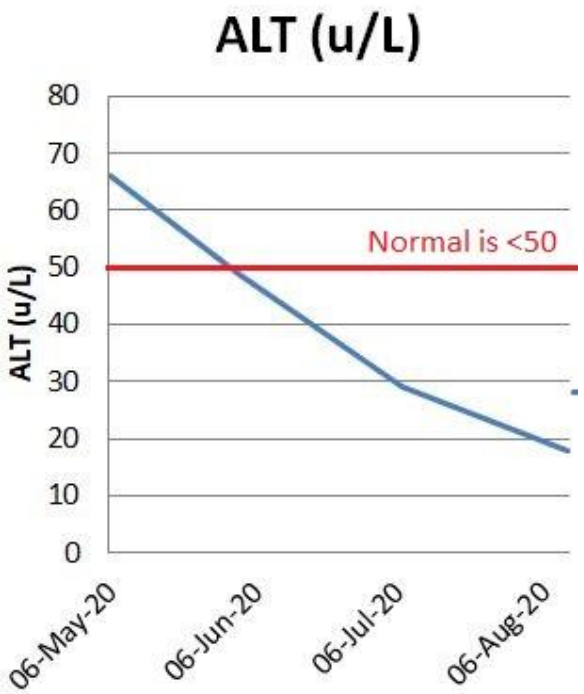


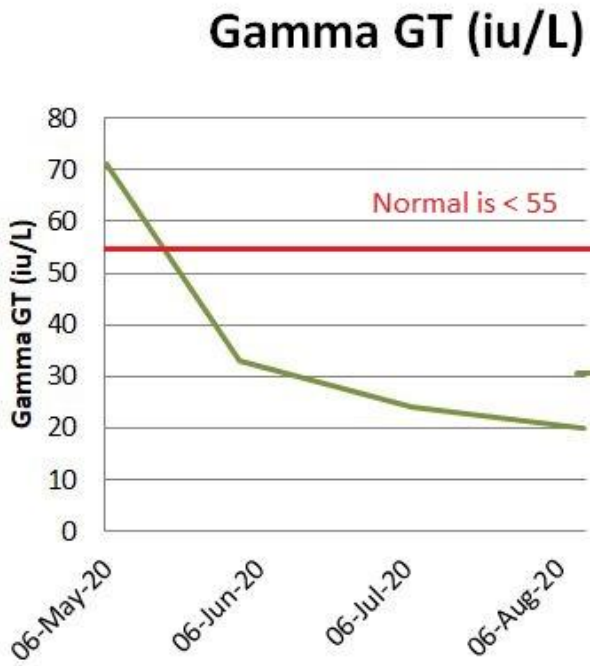


Case History 2 : Liver Function

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- Same patient - liver function tests normalised within one month

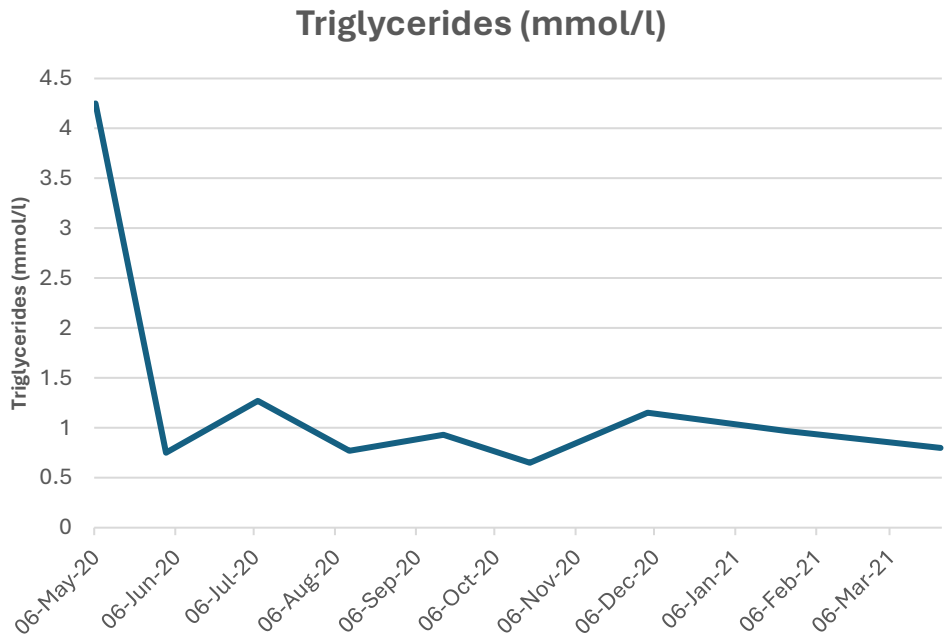


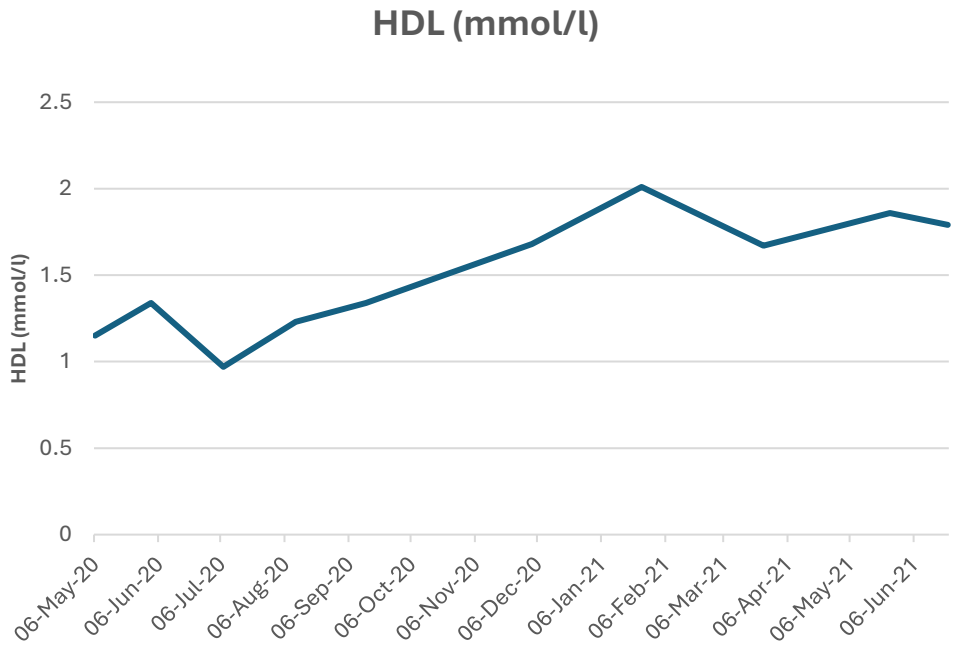


Case History 2: Triglycerides & HDL

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- Triglycerides normalised within one month (4.2 to 0.7 mmol/l
- HDL increased
- Improved 4 components of metabolic syndrome





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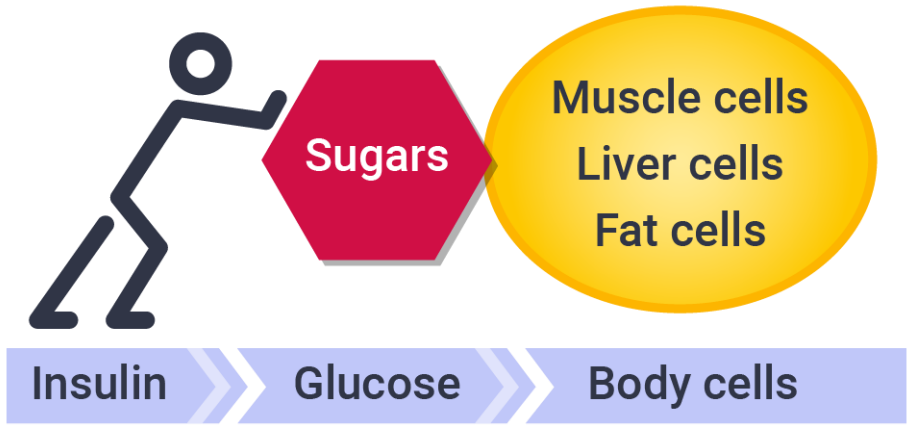
Chronic Hyperinsulinaemia

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- Insulin is a fat storage hormone
- Blocks fat burning
- Frequently raised blood sugar

  → Blood insulin remains high

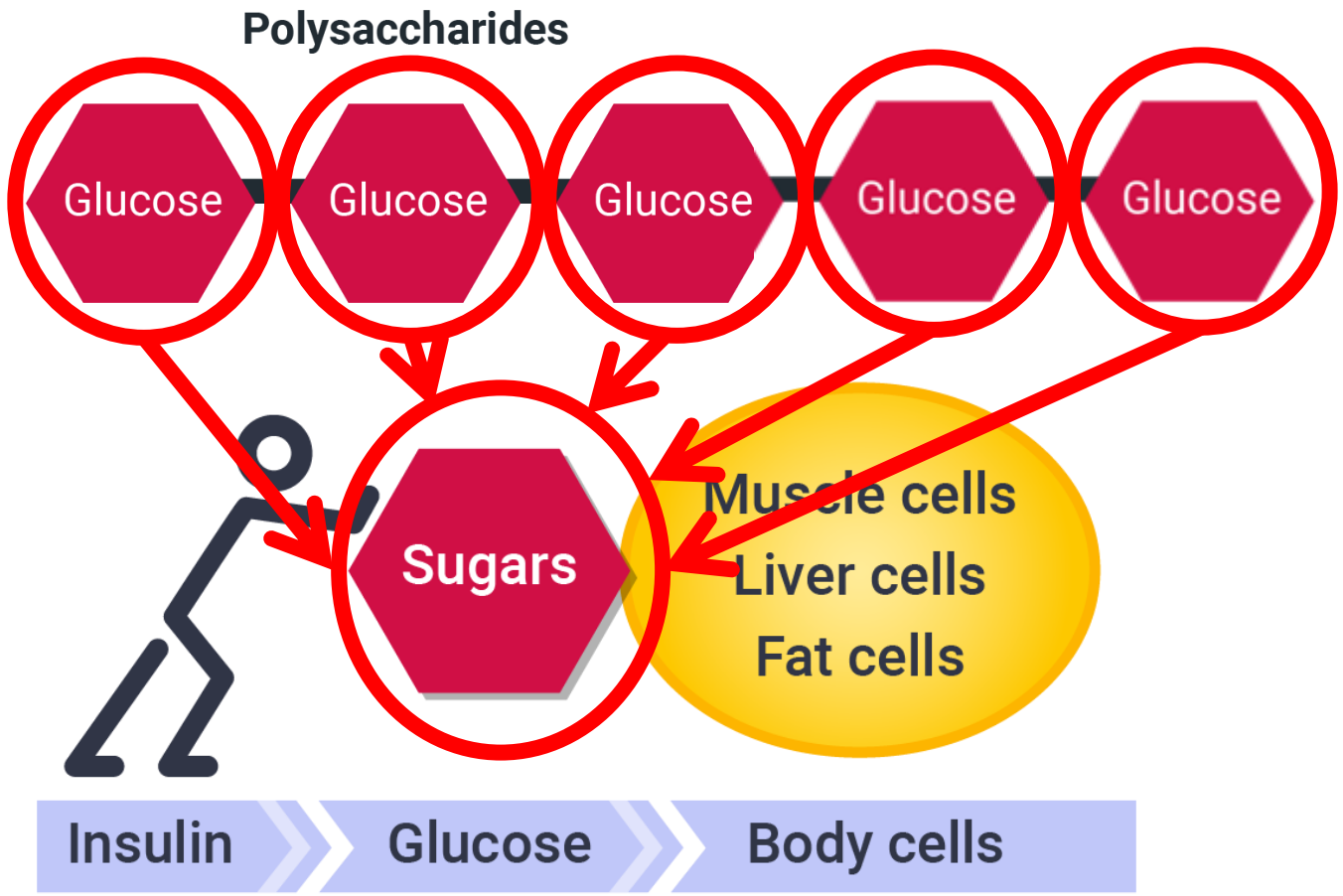
  → Insulin resistance / poor metabolic health



Starchy Carbohydrates Turn to Sugar

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- A starchy carbohydrate molecule consists of a long string of glucose molecules



Sugar

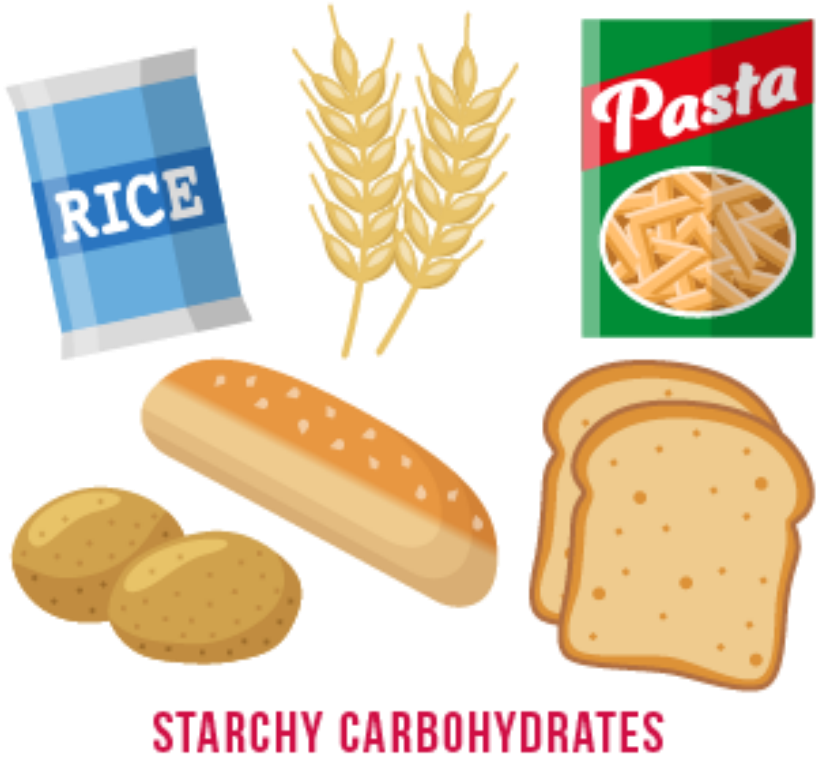
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Reduce starchy carbohydrates

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Dr Unwin's sugar infographics

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- Starchy Carbohydrate turns to sugar

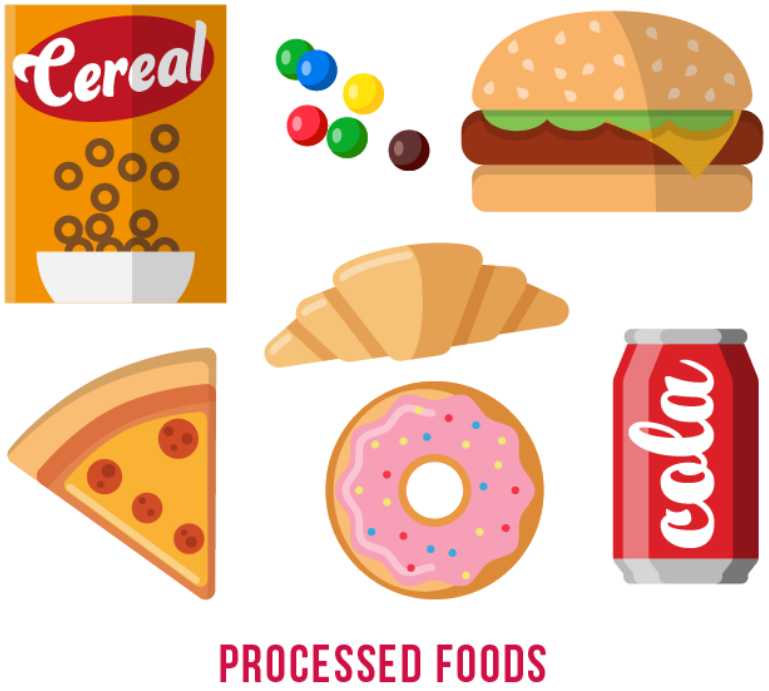
Food Item	Glycaemic index	Serve size g	How does each food affect blood glucose compared with one 4g teaspoon of table sugar?
Basmati rice	69	150	**10.1**
Potato, white, boiled	96	150	**9.1**
French Fries baked	64	150	**7.5**
Spaghetti White boiled	39	180	**6.6**
Sweet corn boiled	60	80	**4.0**
Frozen peas, boiled	51	80	**1.3**
Banana	62	120	**5.7**
Apple	39	120	**2.3**
Wholemeal Small slice	74	30	**3.0**
Broccoli	15	80	**0.2**
Eggs	0	60	**0**

Other foods in the very low glycaemic range would be chicken, oily fish, almonds, mushrooms, cheese

https://phcuk.org/sugar/

Minimise processed food

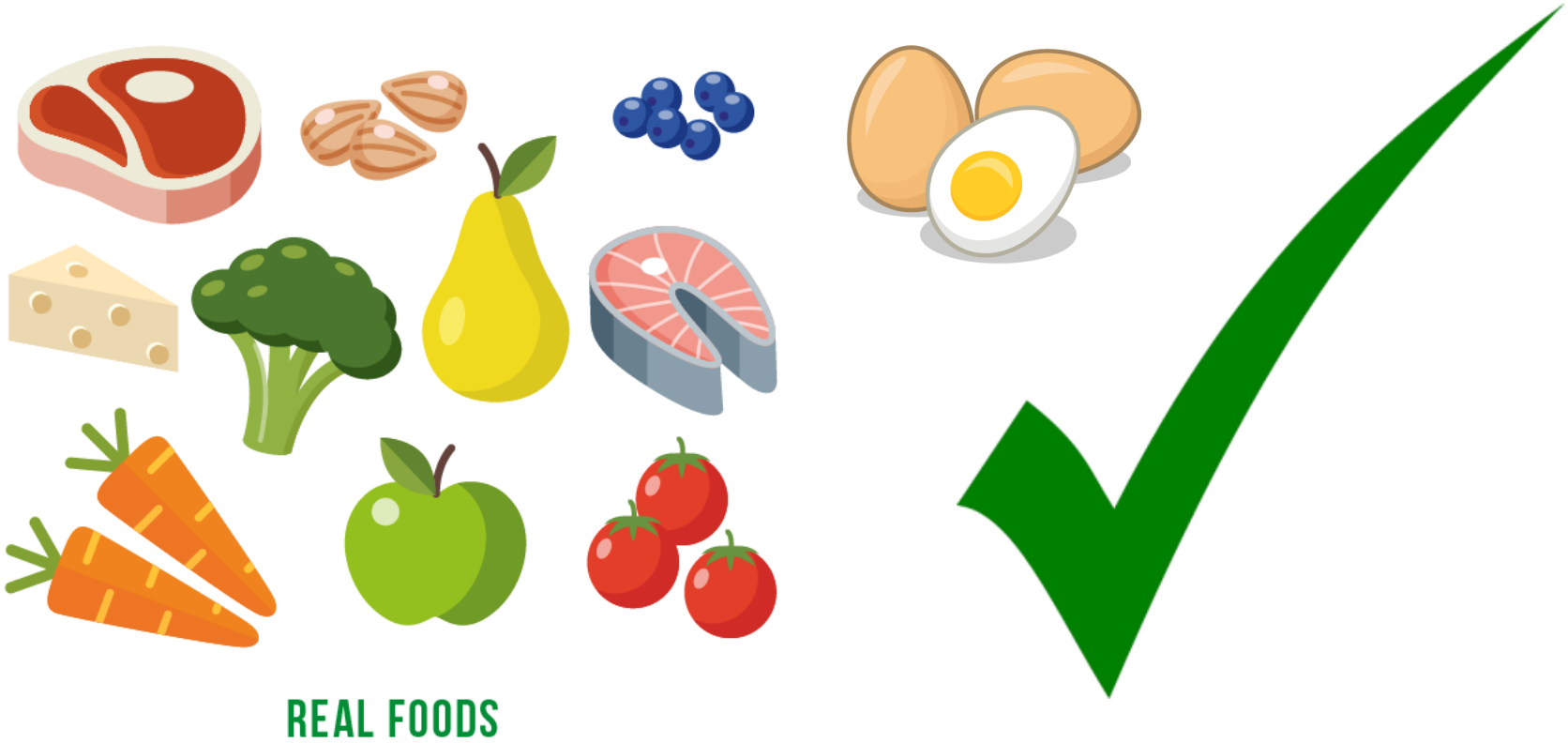
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Eat real food

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Prioritise Protein



Minimise snacks

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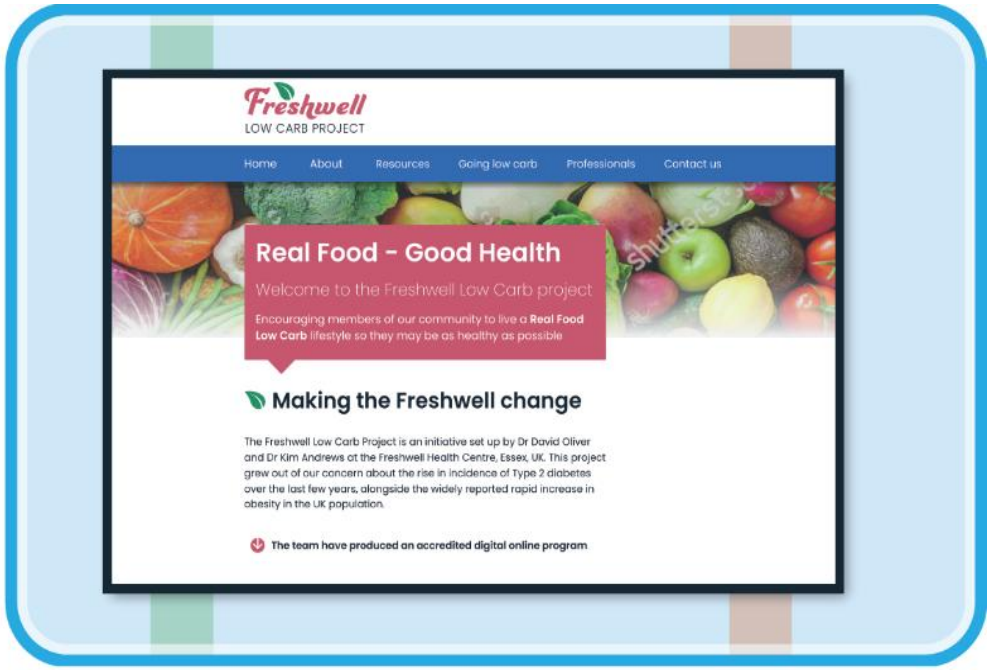
AVOID SNACKING

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Freshwell Low Carb Website



- 10 minutes is not enough!
- Basics of low carb
- Beginners' guide
- Practical tips / swaps

www.lowcarbfreshwell.co.uk

Freshwell Meal Planners

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Infamous Chaffles!

Serves 1 — £1.05 per portion

Chaffles – a low carb wonder! You must give these a go if you have a waffle maker. They can be made sweet or savoury and can also act as the "bread" for a sandwich or scrambled eggs etc. There are so many flavour combinations but essentially they are made of egg and mozzarella cheese.....add a variety of different flavour combinations to come up with the right chaffle for the occasion!

INGREDIENTS

- 1 egg
- ½ cup (110g) grated mozzarella (ready grated works much better as I find the blocks too wet once grated). Cream cheese is an option here – see adaptations below.
- 1 tablespoon (big spoon) coconut flour or almond meal (optional but gives a better texture)
- ½ teaspoon (small spoon) baking powder (optional but gives a better texture)

INSTRUCTIONS

1. Crack the egg into a bowl and whisk.
2. Add the grated mozzarella and stir to combine.
3. Pour into waffle maker and cook until lightly browned. This might take a few attempts to master – on my first attempts, I ended up with waffle mixture everywhere – my advice is to err on the side of not enough batter as it does swell when cooked.....
4. Remove and serve!

Adaption alert

Just egg and cheese will work fine, but the addition of some coconut flour or ground almonds and baking powder gives a much better texture, so I would recommend it if you can.

Mozzarella cheese works best for "sweet" chaffles as it has the most neutral flavour, but if you are making a "savoury" chaffle and would enjoy a more cheesy flavour – then any grated cheese like Cheddar or Red Leicester would work well.

If you don't have mozzarella, then 30g cream cheese works well as an alternative but in this situation you must use the flour too.



FLAVOUR INSPIRATION

- **Cinnamon** – add a pinch of cinnamon and a teaspoon (small spoon) of vanilla essence. Serve with butter and sugar free syrup.
- **Peanut Butter** – reduce the mozzarella to ¼ cup (55g) and add 2 tablespoon (big spoon) peanut butter and 1 teaspoon (small spoon) sweetener and vanilla essence
- **Chocolate** – use 30g cream cheese instead of mozzarella and add 2 tablespoon (big spoon) almond flour, 1 tablespoon (big spoon) unsweetened cocoa powder and 1 teaspoon (small spoon) vanilla essence.
- **Sweet** – add 1-2 teaspoon (small spoon) erythritol or xylitol (sugar alcohols, used as low calorie sweeteners) and a teaspoon (small spoon) of vanilla essence
- **Savoury** – add pinch of salt, paprika, garlic powder, Italian herbs – or any combination to get the flavour you want!
- **Pizza** – if you have any basic red sauce leftovers in the fridge, then add 1tablespoon (big spoon) along with some chopped salami and some dried Italian herbs.



WEEK ONE

(see recipes in bold found in this meal planner)

	BREAKFAST	LUNCH	DINNER
MONDAY	Greek yoghurt with blueberries	**Basic Salad with Easy Salad Dressing** served with ham, cheese or tinned tuna	**Ben's Chilli Con Carne +/- Cauliflower Rice**
TUESDAY	Microwave Cheesy Scrambled Egg	**Smoked Mackerel Pate with cucumber or carrot sticks**	**Cheeseburger Meatzza +/- Basic Salad**
WEDNESDAY	**Microwave Mug Muffin** with berries of your choice	**Bean and Chilli Soup**	**Basic Meat Bolognese Sauce** with soy or lentil pasta
THURSDAY	**Infamous Chaffles** with topping of your choice – try peanut butter or cream cheese	1 or 2 **Basic Bread Rolls** with low carb filling of your choice	**Cottage Pie**
FRIDAY	**Boiled Eggs** dipped in mayo and salt	**Gram Flour Pancakes** with filling of your choice	**Basic Beefburgers** with **Basic Bread Rolls**
SATURDAY	**Microwave Cheesy Scrambled Egg** with bacon	2-3 high meat content sausages with baked beans	**Butter Chicken** with **Cauliflower Rice**
SUNDAY	TWO MEAL DAY – eat brunch and evening meal	Fry Up! (No toast, hash browns or fried bread)	**Grain Free Toad in the Hole** with **Swede Mash**

WEEK TWO

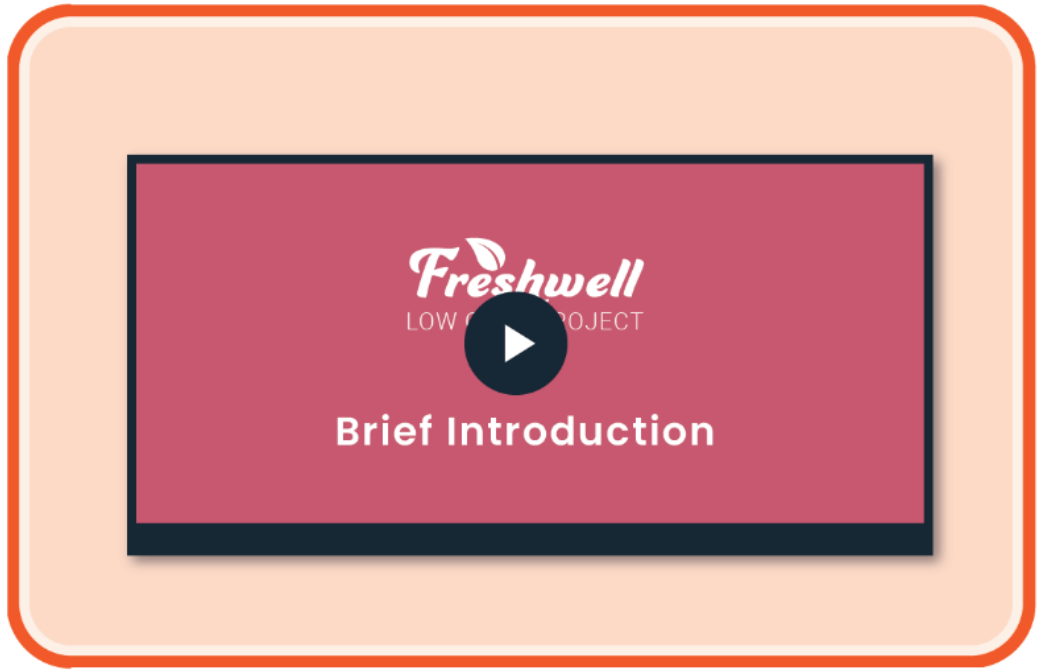
(see recipes in bold found in this meal planner)

	BREAKFAST	LUNCH	DINNER
MONDAY	Greek yoghurt with raspberries	**Microwave Mug Bread** sliced and toasted with low carb topping of your choice	**Luxury Chocolate Chilli** served with **Cauliflower Rice**
TUESDAY	Microwave Mug Muffin with berries of your choice	**Infamous Chaffles** with topping of your choice – try peanut butter or cream cheese – or use to make a sandwich	**One Pot Sausage, Pepper and Tomato Stew**
WEDNESDAY	Soft **Boiled Eggs** with toasted **Microwave Mug Bread**	**Basic Salad with Easy Salad Dressing** served with ham, cheese or tinned tuna	**Basic Cheese Sauce** served with lentil or soy pasta
THURSDAY	**Greek yoghurt with raspberries**	1 or 2 **Basic Bread Rolls** with filling of your choicee	**Lentil Bolognese**
FRIDAY	**Microwave Cheesy Scrambled Egg**	**Bean and Chilli Soup**	**Basic Beefburgers** served with salad, veg or **Basic Bread Rolls**
SATURDAY	**Gram Flour Pancakes** with cream and berries	2-3 high meat content sausages with baked beans	**Grandma's Soya Sauce Chicken** with **Cauliflower**
SUNDAY	TWO MEAL DAY – eat brunch and evening meal	Fry Up! (No toast, hash browns or fried bread)	**Chicken Tray Bake**

- "Just tell me what to eat!"
- 4-week meal planners
- Vegetarian & budget
- Free PDFs on website
- On the Freshwell App
- Hard copies by mail order

Structured Educational Programme - videos

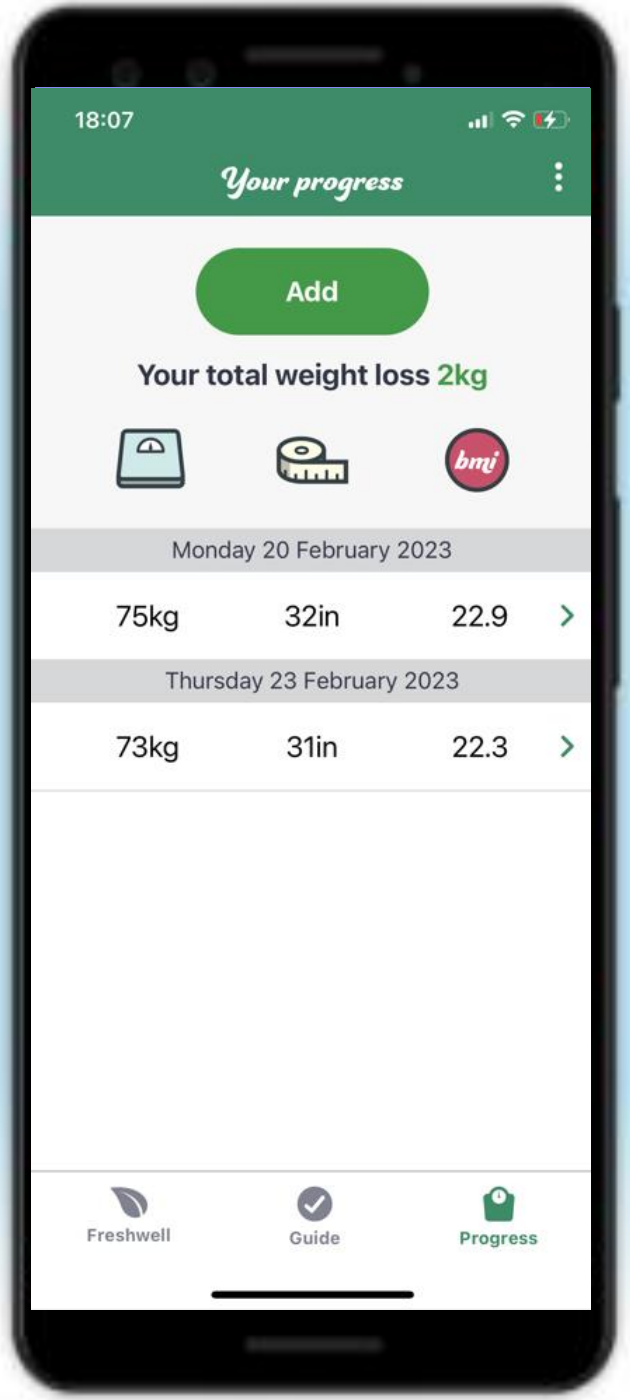
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- Structured course
- 6 modules – 30 mins
- Prediabetes and T2DM

Freshwell App

- Basics of low carb
- Sugar infographics
- 6 weekly modules
- What should I eat?
- Progress tracker
- Free
- Not for profit
- No ads, no pop ups
- >250,000 downloads to date
- 4.8 ⭐ on Apple / Google Play



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Download on the App Store

GET IT ON Google Play

Accreditation

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- Structured educational programmes

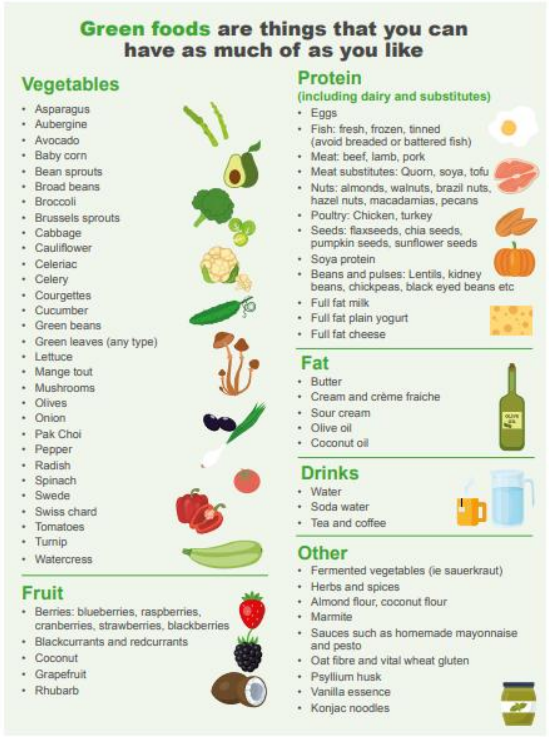
- QISMET accreditation for
  - Weight loss, Pre-diabetes, Type 2 diabetes

- QOF Structured Education
  - Type 2 Diabetes DM14 ✅
  - Obesity OB004 ✅

- Free
- No referral required, just signpost
- Brief intervention, SMS

Red Amber Green Guide

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Green foods are things that you can have as much of as you like

Vegetables

- Asparagus
- Aubergine
- Avocado
- Baby corn
- Bean sprouts
- Broad beans
- Broccoli
- Brussels sprouts
- Cabbage
- Cauliflower
- Celeriac
- Celery
- Courgettes
- Cucumber
- Green beans
- Green leaves (any type)
- Lettuce
- Mange tout
- Mushrooms
- Olives
- Onion
- Pak Choi
- Pepper
- Radish
- Spinach
- Swede
- Swiss chard
- Tomatoes
- Turnip
- Watercress

Fruit

- Berries: blueberries, raspberries, cranberries, strawberries, blackberries
- Blackcurrants and redcurrants
- Coconut
- Grapefruit
- Rhubarb

Protein
(including dairy and substitutes)

- Eggs
- Fish: fresh, frozen, tinned (avoid breaded or battered fish)
- Meat: beef, lamb, pork
- Meat substitutes: Quorn, soya, tofu
- Nuts: almonds, walnuts, brazil nuts, hazel nuts, macadamias, pecans
- Poultry: Chicken, turkey
- Seeds: flaxseeds, chia seeds, pumpkin seeds, sunflower seeds
- Soya protein
- Beans and pulses: Lentils, kidney beans, chickpeas, black eyed beans etc
- Full fat milk
- Full fat plain yogurt
- Full fat cheese

Fat

- Butter
- Cream and crème fraiche
- Sour cream
- Olive oil
- Coconut oil

Drinks

- Water
- Soda water
- Tea and coffee

Other

- Fermented vegetables (ie sauerkraut)
- Herbs and spices
- Almond flour, coconut flour
- Marmite
- Sauces such as homemade mayonnaise and pesto
- Oat fibre and vital wheat gluten
- Psyllium husk
- Vanilla essence
- Konjac noodles



Amber foods are foods which are ok in moderation

Vegetables

- Beetroot
- Butternut squash
- Carrots
- Leeks
- Parsnips
- Peas
- Pickled vegetables
- Sweetcorn

Fruit

- Apples
- Cantaloupe melon
- Cherries
- Figs
- Galia melon
- Honeydew melon
- Kiwi
- Melon
- Nectarine
- Orange
- Pears
- Plums
- Watermelon

Protein
(including dairy and substitutes)

- Peanuts (but be careful not to have too many)
- Nuts: cashews, pistachios, chestnuts
- Processed meats: bacon, ham, sausages
- Baked beans in tomato sauce (choose reduced sugar)
- Low fat cheese
- Low fat milk
- Low fat yogurt
- Coconut milk, almond milk and soya milk (choose unsweetened versions)

Drinks

- Diet drinks
- Red or white wine
- Spirits with diet mixers
- Cocoa

Other

- Arrow root
- Dark chocolate (min 80% cocoa)
- Gram flour
- Sweeteners: stevia, erythritol, xylitol



Red foods are foods to avoid as much as possible

Vegetables

- Potatoes
- Sweet potatoes

Fruit

- Bananas
- Dried fruit
- Fruit juice
- Grapes
- Mango
- Pineapple
- Tinned fruit in syrup or juice

Starchy carbohydrates

- Bread
- Cereal: Weetabix, cornflakes, porridge, oats, granola, all-bran etc
- Cous cous
- Pasta
- Rice
- Rice based products: rice cakes and bars
- Wheat based products: wraps, pitta bread, flat bread, pizza, ryvita
- Wheat flour
- Rice milk and oat milk

Fat

- Vegetable seed oils: rapeseed, sunflower, cottonseed, Canola
- Margarine
- Low fat spreads
- Low fat cooking spray

Drinks

- Beer
- Cider
- Cordials
- Fizzy drinks
- Fruit juice
- Sports drinks

Sweet and processed foods

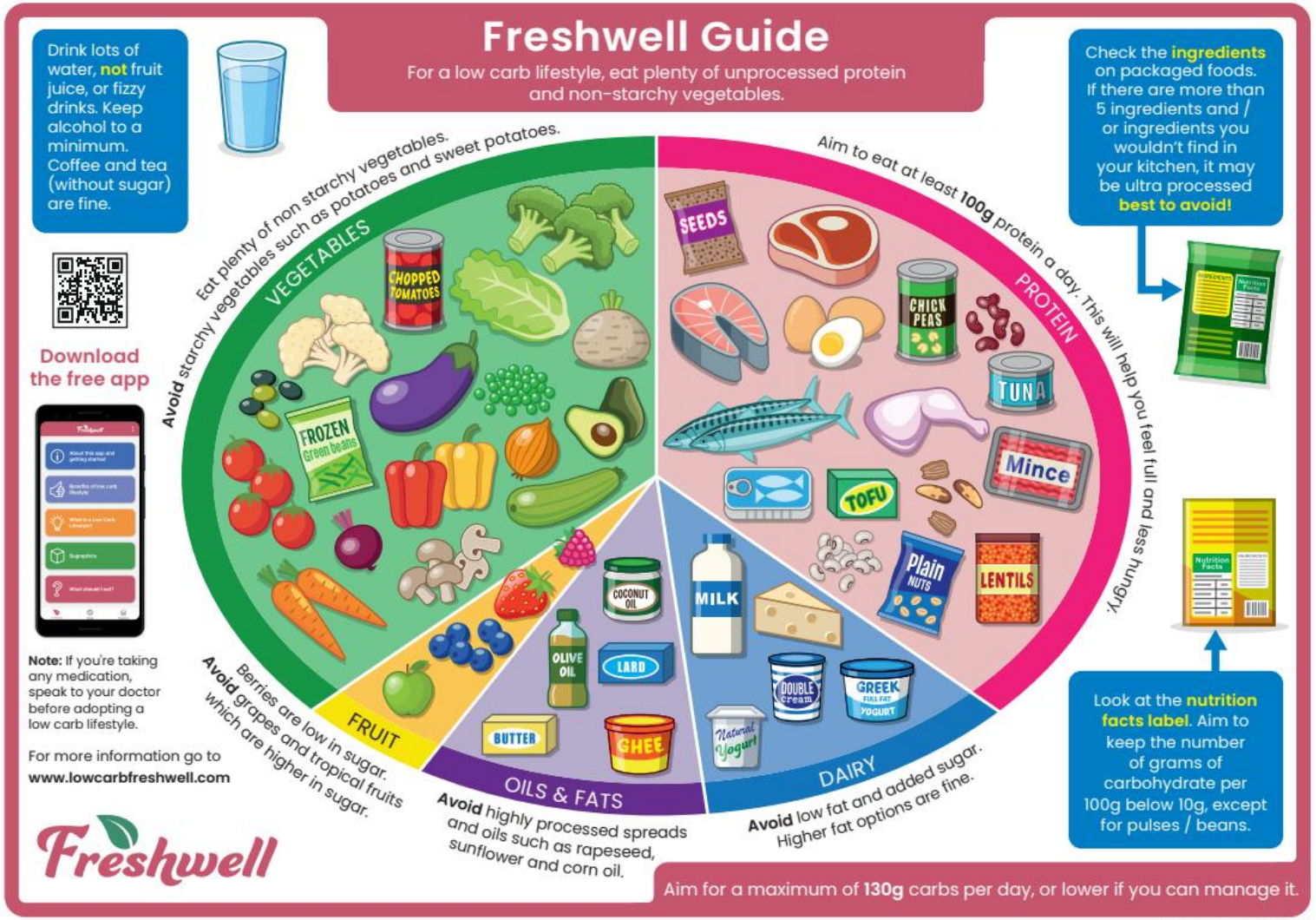
- Biscuits
- Breadsticks
- Cakes
- Chips
- Crackers
- Crisps
- Honey
- Ice cream
- Jam
- Maple syrup
- Milk chocolate
- Milkshake
- Pies and sausage rolls
- Protein bars
- Sugary sauces
- Sugary drinks
- Sweeteners (apart from those listed in the amber zone)
- Sweets
- Fruit yogurt containing sugar or sweeteners

29/2/2024

Printable from Freshwell Low Carb Website, also in Freshwell App

Think Outside the Plate!

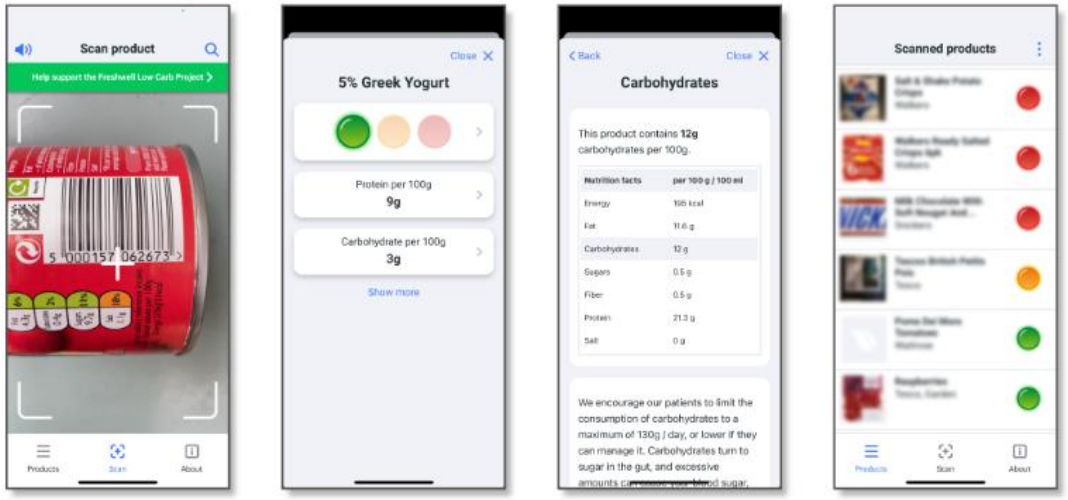
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Freshwell Food Barcode Scanner App

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- 1,000s of items in a typical supermarket
- Bewildering number of ingredients
- Often false “healthy” claims
- Freshwell food scanner
- Maps to Red / Amber / Green
- Free

Download on the App Store

GET IT ON Google Play

Freshwell Low Carb Community

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- Peer support, expert patients
- Community group
- 6,000 members on Facebook
- Local drop-ins
- Cooking demos
- Meals out
- Park Run

Limitations of Freshwell resources

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- English only
- Limited multi-cultural recipes
- Digital literacy barriers
- Not suited to everyone
- Limited individual support
- Limited long-term outcome data

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Common Concerns about low carb

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- Saturated fat intake
- Expense
- Sustainability

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What about Fat?

Saturated fat : what does the evidence show?

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Substituting saturated fat in randomised dietary trials

LDL cholesterol	**Consistently reduced**	Strong evidence
Combined CVD events	**17% relative reduction**	RR 0.83 (95% CI 0.70–0.98)
Cardiovascular mortality	**No clear reduction**	RR 0.95 (0.80–1.12)
All-cause mortality	**No clear reduction**	RR 0.96 (0.90–1.03)

Source: Hooper et al. Cochrane Database Syst Rev. 2020; CD011737. 15 RCTs, >56,000 participants.

The Minnesota Coronary Experiment (1968–1973)

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Randomised trial: replacing saturated fat with vegetable oil, 9,400 participants

Total cholesterol	**Significantly reduced**	13.8% reduction in intervention group
All-cause mortality	**No demonstrated benefit**	No mortality reduction in randomised comparison
Coronary outcomes	**No demonstrated benefit**	No reduction in coronary heart disease deaths shown
The paradox	**Greater cholesterol fall linked to higher mortality**	HR 1.22 per 0.78 mmol/L fall*

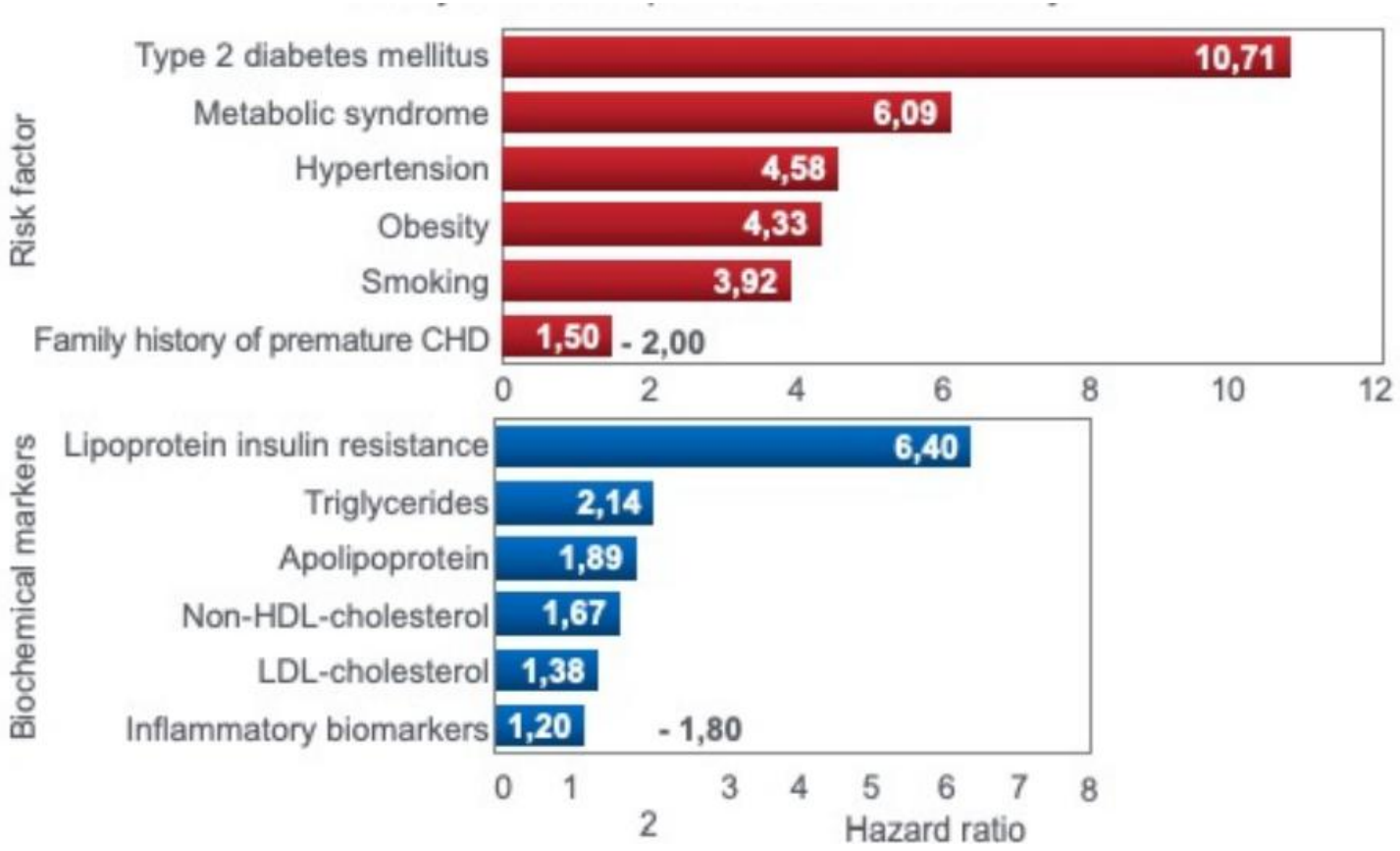
Lower cholesterol did not translate into longer life.

Source: Ramsden et al. BMJ 2016;353:i1246. *Association, not proof of causation; incomplete recovered data.

Premature CHD Risk Factors ♀ <55yo

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Women's Health Study • based on 28,024 women followed for over 20 years.



Source: Dugani et al., JAMA Cardiol 2021;6:437–447. Graph adapted by Noakes, Open Heart 2021;8:e001680.

Low carb & Risk Factors

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Marker	Typical response to low carb
Weight	↓
Waist circumference	↓
Triglycerides (mmol/l)	↓↓
HDL (mmol/l)	↑
HbA1c (mmol/l)	↓
Blood pressure (mmHg)	↓
Fatty liver (≈ALT u/L)	↓
LDL (mmol/l)	↔ / ↑

Evidence: Goldenberg et al., BMJ 2021; Jayedi et al., AJCN 2022; Hansen et al., Ann Intern Med 2023.

Low carb & Risk Factors & Case History 2

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Marker	Typical response to low carb	Before	After	Actual change
Weight	↓	101 kg	77kg	↓↓
Waist circumference	↓			↓
Triglycerides (mmol/l)	↓↓	4.3	0.6	↓↓
HDL (mmol/l)	↑	1.2	1.8	↑
HbA1c (mmol/l)	↓	114	35	↓↓↓
Blood pressure (mmHg)	↓	138/80	120/74	↓
Fatty liver (≈ALT u/L)	↓	66	18	↓
LDL (mmol/l)	↔ / ↑			

Evidence: Goldenberg et al., BMJ 2021; Jayedi et al., AJCN 2022; Hansen et al., Ann Intern Med 2023.

Low carb & Risk Factors & Case History 2

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Marker	Typical response to low carb	Before	After 12 months	Actual change
Weight	↓	101 kg	80kg	↓↓
Waist circumference	↓			↓
Triglycerides (mmol/l)	↓↓	4.3	0.6	↓↓
HDL (mmol/l)	↑	1.2	1.8	↑
HbA1c (mmol/l)	↓	114	35	↓↓↓
Blood pressure (mmHg)	↓	138/80	120/74	↓
Fatty liver (≈ALT u/L)	↓	66	18	↓
LDL (mmol/l)	↔ / ↑	**4.8**	**5.1**	↑

Evidence: Goldenberg et al., BMJ 2021; Jayedi et al., AJCN 2022; Hansen et al., Ann Intern Med 2023.

Is low-carb too expensive?

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- **Food poverty is real** – cheap, refined carbohydrates are often the lowest-cost calories.
- **Low-carb needn't be expensive** – eggs, tinned fish, frozen& tinned veg and other supermarket staples
- **Cost is only part of the picture** – time, cooking skills, facilities, confidence and access to food all matter.
- **Practical support makes a difference** – simple recipes, the free Freshwell budget meal planner and social prescribing

We shouldn't let assumptions about affordability prevent us from offering patients a choice.

An expensive way of eating?

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Homemade tuna salad

Tuna (in olive oil), mixed salad, cucumber, tomatoes, peppers, seeds, olive oil & apple cider vinegar dressing

	Tuna salad
Cost	£3.12
Calories	450 kcal
Protein	35 g
Carbohydrate	24 g
Sugars	14 g
Fat	27 g
Saturated fat	4 g
Fibre	10 g
Vegetables	~430 g

An Expensive Lunch?

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Homemade tuna salad

Tuna (in olive oil), mixed salad, cucumber, tomatoes, peppers, seeds, olive oil & apple cider vinegar dressing

	Tuna salad	Typical meal deal
Cost	£3.12	£3.85 (Clubcard)
Calories	450 kcal	770 kcal
Protein	35 g	28 g
Carbohydrate	24 g	105 g
Sugars	14 g	53 g
Fat	27 g	27 g
Saturated fat	4 g	5 g
Fibre	10 g	5 g
Vegetables	~430 g	Minimal



Typical supermarket meal deal

Chicken mayonnaise sandwich, ready salted crisps and Coca-Cola (500ml)

Are low-carb diets harder to sustain?

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- Little convincing evidence – low carb vs other approaches

- Individual preference, may matter more than macros
  - Perceived benefits,
  - Food environment
  - Ongoing support

- Reduced hunger and cravings for some
- Early metabolic improvements motivate

References: Shai et al. NEJM 2008 (DIRECT); Sacks et al. NEJM 2009 (POUNDS LOST); Gardner et al. JAMA 2018 (DIETFITS).

Colne Valley Primary Care Network Low Carb Programme

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PCN Outcome Data

- Weight loss data following low carb HWBC referral
- n = 1,106
- Average weight loss = 3.6kg
- Mean follow up 1y 9 months

Case History 3



- Hyperosmolar Hyperglycaemic State
- Blood glucose 41 mmol/l
- HbA1c 95 mmol/mol
- “Lifelong” insulin 35u / day

Case History 3 – T2DM Remission



- 10 months later
- ↓20kg
- HbA1c 34
- OFF ALL MEDS

Case History 4 – Obese for 20 years

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- Tried most diets:
- Weightwatchers,
- Slimfast,
- NHS guidance
- Always lost some (1 – 2 stone)
- then put it back on
- Was told she needed a knee replacement

Obese for 20 years – no more

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- 6 Stone lost
- BMI 38 → < 25
- Waist ↓ 11 inches
- BP Medication reduced
- Knee pain gone
- IBS much improved
- Expert patient in our community

In conclusion:

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- We need to talk less about BMI and more about metabolic health
- A low carb approach can transform metabolic health
- Case histories show what may be possible
- Patients should be given the opportunity to try
- Freshwell offers free accredited low carb resources to help

Finally:

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← Freshwell website QR code

← Freshwell app QR code

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Any questions?