PLANT-BASED DIETS ON KETOGENIC DIETARY THERAPY (PBKDT)

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TRUSTEE , MATTHEW'S FRIENDS

In the past few years there has been a huge increase in those following plant-based diets.

CLICK HERE TO VISIT: HOW MANY VEGETARIANS AND VEGANS ARE IN THE UK? - FINDER UK

It's not just the trend of the last few years. The UK includes a huge diversity in culture and religious beliefs, many of which embrace plant-based diets.

CLICK HERE TO VIEW: FAITH POSTER

MF have certainly noticed an increase in the number of inquiries we are getting relating to PBKDT.

During my time working with MF Clinic's, we supported a handful of patients following plant based Ketogenic Dietary Therapy (PBKDT). Mainly following vegetarian KDT. Only 2 patients were following vegan KDT, both had started out on their own. One needed a great deal of guidance from our dietitian, the other had an amazing knowledge and ate a very wide variety of foods.

Susan Baum specialist dietitian from Germany gave presentations at the 2021 Global symposium in Brighton and more recently at the GLUT1 conference in Aschaffenburg on how she manages vegan KDT. Interesting, but what are the practicalities?

All medical KDT's, because of their restriction in carbohydrate (CHO) need supplementation. Many patients also come with restrictions because of allergies/ intolerance issues. So, what is the impact of further restriction?

Informed choice is what I am aiming for in this article. I decided the best way to gain further insight was to try vegetarian/Vegan KDT for myself.

CLICK HERE TO VISIT: BRITISH DIETETIC ASSOCIATION GUIDANCE PLANT-BASED DIETS

MY EXPERIENCE OF FOLLOWING A PBKDT – WHAT DO I NEED TO BE AWARE OF?

Any diet can be poor, add on multiple anti-seizure medications (ASM's) which can interfere with vitamin and mineral absorption, and you can see why it is so important to get blood levels checked and to fill those food diaries in prior to starting KDT to find out if there is any baseline nutritional imbalances or deficiencies.

All KDT's, because of their restriction in carbohydrate (CHO) require supplementation. Medical KDT's need to be closely monitored by a specialist team.

CLICK HERE TO VIEW: **SUPPLEMENTATION**

SOME SPECIFIC DEFICIENCIES TO BE AWARE OF FOLLOWING PBKDT	I WILL TRY TO INCLUDE KETO FRIENDLY FOOD SOURCES
Essential Omega-3 fat	Flax oil, nuts and seeds
B12	Soya milk and yoghurt
Calcium	Soya milk, nuts and seeds
Zinc	Egg, soy, mushrooms, nuts and seeds
Iodine	Seaweed
Vitamin D	Soya milk and yoghurt (Summer sunshine)
Iron	Spinach, nuts and seeds
Selenium	Brazil nuts
Carnitine	Avocado, tempeh, asparagus

FAT

For vegan KDT I need to find alternative fat choices as dairy is no longer an option. This was not a problem for me as I do not include cow's milk products in my diet.

So, you will see although I could have used more dairy products like cream and butter during veggie week I tended to stick to the plant products, like Elmlea plant double cream and Pure spread.

PROTEIN

I will need to find alternatives to fish and meat, like nuts and nut butters, seeds, tofu, tempeh, eggs and dairy, Quorn and seitan.

The link below also lists vegetables that are higher in protein.

CLICK HERE TO VIEW: VEGAN KETO PROTEIN OPTIONS: TOP 30 FOOD SOURCES

Also see further guidance in the links below.

CLICK HERE TO VIEW: THE HEALTHY VEGETARIAN KETO DIET

CLICK HERE TO VIEW: ESSENTIAL NUTRIENT NEEDS ON A LOW-CARB VEGAN DIET

KDT VEGETARIAN WEEK

My husband is chief cook in our house but the omnivores in my house rebelled, I was on my own! I do know how to make up a keto meal, but I am not the greatest cook, so my plan was to keep things as simple as possible!

The weekend before starting I shopped for the week and batched up Mo's rolls and muffins (slightly adapted with added flax) for the freezer. I had my porridge recipe ready for Monday morning. I thought I was very organised.....

ROLLS (PER ROLL)

- Ground almonds 21g
- Flax seed 6g
- Egg white 18g
- Psyllium husk
- White wine vinegar
- Barkat
- Salt

PORRIDGE

- Ground almonds 22g
- Alpro soya light milk 150g
- Desiccated coconut 17g
- Flax 15g
- Oats 3g

RHUBARB MUFFINS

- Ground almonds 10g
- Desiccated coconut 6g
- Egg 12g
- Flax 3g
- Pure olive oil spread 8g
- Rhubarb 20g

FOOD DIARY

Day	Breakfast	Snack	Lunch	Snack	Tea	Drinks
Day 1	• Roll • 2 x eggs • 7g Pure olive oil spread • 13g Mayo • 50g Rhubarb • 25g Alpro soya Greek yoghurt	-	• Waitrose rainbow salad, tomato removed • 30g Hard goat cheese • 10g Oil • 15g Mayo	• 15g Meridian peanut butter • 50g celery	• 80g Greek Cypriot grilling cheese • 56g Courgettes • 22g Peppers yellow • 23g Pepper red • 40g Mushrooms • 20g Lettuce • 15g Oil • 26g Mayo	• Tea x4 • Mint tea x 2 • Water 1 litre • Diet coke 500ml
Day 2	• Porridge	• 50g Olives • 20g Hard goat cheese	• Roll • 30g Hard goat cheese • 13g Mayo • 7g Pure olive oil spread • 70g Cucumber in vinegar • 50g Strawberries	• Rhubarb muffin	• Omelette • 2 eggs • 63g Spinach • A couple of mushrooms • 23g Red pepper • 35g Lettuce • 33g Cucumber • 34g Strawberries • 10g Chilli oil • 26g Mayo	• Tea x 6 • Water 1.5 litre
Day 3	• Porridge	• 30g Peanuts	• Roll • 40g Hard goat cheese • Spinach handful • 7g Pure olive oil spread • 26g Mayo • 34g Strawberries • 11g Blueberries • 25g Alpro soya yoghurt	• 30g peanuts In the evening	• Tofu 100g • A few mushrooms • 90g Celeriac • 15g Chilli oil • 7g Pure olive oil spread • 62g Broccoli • 13g Mayo	• Tea x 6 • Water 2 litres • x2 small glass-es dry red wine
Day 4	• Porridge • Flax now increased to 15g	• 14g Walnuts	**Out** • 3 egg omelette included: mushrooms, roasted red peppers, tomato, Iceburg lettuce & cucumber • Approx 5g CHO lunch • Mayo 26g	-	• Roll • 40g Hard Sheep cheese • 50g Olives • ¼ tub Tsatsiki (Sainsburys)	• Tea x 5 • Water 1.5 litres • x2 Diet coke 500ml • x2 small glass-es dry red wine
Day 5	• Porridge	-	• x2 Rhubarb muffin	-	• 100g Tofu • 32g Spinach • 35g Tomato • 23g Red pepper • Roll • 15g Oil • 32g Mayo	• Tea x 4 • Mint tea x 2 • Water 2.5 litre
Day 6	• Porridge	• 30g Peanuts	• Roll • 2 x boiled eggs • 7g Pure olive oil spread • 68g Cucumber • 26g Mayo • 55g Strawberries	• Rhubarb muffin	• 75g Quorn chunks • 10g Meridian peanut butter • 46g Cauliflower • A couple of mushrooms • 32g Spinach • 20g Chilli oil • 50g Coconut milk • 50g Alpro soya light milk	• Tea x 5 • Water 1.5 litres • x2 Diet coke 500ml • x2 small glass-es dry red wine

Day 7	• Porridge	• ½ rhubarb muffin	• 100g Tofu • Roll • 26g Mayo • 10g Oil • 67g Cucumber • 37g Strawberries	• 15g Meridian peanut butter • 50g Celery	• 75g Quorn mince • 86g Celeriac • 25g Avo • 10g Oil • 7g Pure olive oil spread • 20g Mayo • A couple of mushrooms • ¼ tsp Marmite • 35g Lettuce • 25g Celery • Fennel, seeds, rosemay and mint	• Tea x 4 • Mint tea x 2 • Water 2.5 litre

THE PRACTICALITIES

Day 1 – I was visiting my Mum by train

Maybe not so organised!

- I went to make the porridge for breakfast only to find that I had used all the ground almonds the day before in the rolls and muffins. Hence I had to make a quick switch to the keto roll & eggs, with rhubarb thrown in, you may notice a bit of a theme here? Extra flax, rhubarb...
- I found my scales flashing 'battery low' luckily my husband had a CR32 battery stash!
- I had planned strawberries & walnuts as a morning snack, but somebody finished all the strawberries last night. I ended up not having an AM snack.
- The peanut butter we had in was not as I thought Whole Earth brand, but Meridian so I needed to calculate less for my afternoon snack.
- I had intended to walk to the station, all the changes meant I was late and so ended up getting a lift to the station.
- On arrival I went to buy a ready prepared Greek salad at the local supermarket with its own pot of oil dressing. They had none. I had to buy separate salad, cheese and oil, luckily, I knew Mum had some mayonnaise.
- I was late getting home, but tea was quick and delicious.
- I realise looking at my fluid intake that I need to be drinking more water!

Day 2 was an office day

- Ran much more smoothly, although packing the food up for the day before work took longer, I thought it may have been better to have prepared the packed lunch and snacks the night before. It was great to have the rhubarb muffins already made to just take out of the freezer as needed. I also found the 30g snack packets of peanuts handy, especially when out and about.

Day 3 after dinner we drove up to the midlands to visit my daughter.

- I kept my PM snack to have when we got there with a glass of wine.

Day 4 was busy with my new grandson, Tom.

- Lots of bouncing him up and down on an exercise ball to get him off to sleep! We ate out in a café where omelettes were cooked to order. I asked that they add no milk to the omelette, perfect with a side salad and I took a squeezy bottle of Hellmann's mayonnaise in my handbag.
- That evening we ate 'picky' tea in the garden, so I ate cheese, olives and Tsatziki alongside one of Mo's rolls. I did buy some liver pate, forgetting I was vegetarian, but luckily realised when I was looking at the values oops! Mushroom pate was what I should have been looking at!

CLICK HERE TO VIEW: SAINSBURY'S ROASTED MUSHROOM PATE 100G ➔

Day 5 I find that bouncing on the exercise ball yesterday has taken its toll on my back!

- The drive back, stopping off at my Mums on the way, was pretty uncomfortable. I didn't feel like eating or cooking, hence no snacks and 2 muffins for lunch that day.

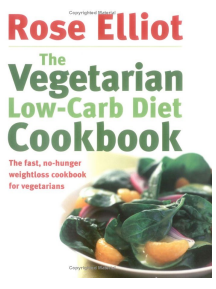
SIDE EFFECTS

Alas, by day 3 constipation was a problem, the Movicol came out, despite the rhubarb, flax and psyllium husk! I guess I need to drink more water, dance more?! To be fair I am the only person I know who backpacking through Southeast Asia needed to take senna!

I didn't feel any 'keto flu' like effect. I think this is because I generally eat low carb already, it wasn't such a huge transition for me.

This book, although aimed at weight loss contains some lovely recipes that are easily adapted for a stricter medical KDT.

CLICK HERE TO VIEW: THE VEGETARIAN LOW-CARB DIET COOKBOOK ➔



VEGAN KETO WEEK

Starting Vegan keto week, although I was initially daunted, having managed veggie week I thought it would be fine. I knew I had to concentrate on maximising my protein intake and specific vitamins.

I had my porridge recipe ready to go, but just added 50g extra Soya milk to boost protein content. Rolls and muffins were batched and frozen. Mo's vegan roll recipe, using egg replacer, inspired me to adapt the rhubarb muffins too.

The protein biscuits came later when I was struggling to get enough protein in through the day.

I would say that I was more organised starting out but underestimated the challenges and my gut.

ROLLS (PER ROLL)
- Ground almonds 20g
- Flax seed 6.5g
- Egg replacer 'Free & Easy' 1.5g
- Psyllium husk
- White wine vinegar
- Barkat
- Salt

PORRIDGE
- Ground almonds 22g
- Alpro soya light milk 200g
- Desiccated coconut 17g
- Flax 15g
- Oats 3g

RHUBARB MUFFINS
- Ground almonds 10g
- Desiccated coconut 6g
- Egg replacer 'Free & Easy' 1.5g
- Flax 3g
- Pure olive oil spread 8g
- Rhubarb 20g

PROTEIN BISCUIT
- Ground almonds 6g
- Egg replacer 1.5g
- Flax 6g
- Pulsin soya protein powder 5g
- Pure olive oil spread 5g
- Oil 1g
- Mixed spice

CLICK HERE TO VIEW: FREE AND EASY EGG REPLACER - ASDA GROCERIES

CLICK HERE TO VIEW: PULSIN SOYA PROTEIN ISOLATE 250G - TESCO GROCERIES

FOOD DIARY

Day	Breakfast	Snack	Lunch	Snack	Tea	Drinks
Day 1	• Porridge	• 25g Peanuts	• Roll x1 • 19g Vegan feta • 15g Walnuts • 10g Sesame seeds • 60g Spinach • 5g Pure olive oil spread • 10g Sesame Oil	• 100g Alpro no sugar plain yoghurt Link here • 50g Elmlea plant double cream Link here • 22g Raspberries	• No tea	• 7 mugs of tea • 2.2 litres water • Movicol
Day 2	• Porridge	• 25g Peanuts	• 1 x roll • 55g Tofu • 5g Chilli oil • 30g Olives • 30g Spinach • 5g Pure olive oil spread • 15g Vegan mayonnaise • 200g Alpro soya light milk Link here	• Rhubarb muffin	• 70g Tempeh • 15g Chilli oil • 15g Vegan mayonnaise • 50g Kale • 50g Mushrooms • 50g Elmlea plant double cream • Raspberries 44g Link here	• 6 mugs of tea • 2 litres water • Movicol
Day 3	• Porridge • 5g Soya pulsin protein powder	• Peanuts 30g • 1 x packet seaweed snack	• Roll x1 • 63g Tofu • 5g Chilli oil • 10g Pure olive oil spread • x1 Avocado small • 15g Mayo • 15g Spinach • 70g Cucumber	• 25g Almonds	• 20g Edamame pasta Link here • 50g Elmlea cream • 15g Mayo • 50g Mushrooms • 10g Oil • 20g Olives • 14g Red pepper • 15g Walnuts • 200g Alprosoya no sugar milk	• 7 x mugs tea • 1.5 litres water
Day 4	• Porridge	• 15g Meridian peanut butter • 50g Cellery • 5g Pure olive oil spread	• Roll x1 • 61g Tofu • 5g Chilli oil • 10g Pure olive oil spread • 15g Mayo • 58g Cucumber	• Rhubarb muffin	• 86g Celeriac • 40g Mushrooms • 40g Spinach • 10g Oil • 10g Olives • 12g Vegan cheddar • 40g Tofu • 10g Vegan mayonnaise • 30g Peanuts Link here	• 6 x mugs tea • 2 litres water • 1 x small glass red wine
Day 5	• Porridge	• Protein biscuit • 100g Alpro soya light milk	• 300g Alpro light milk • 20g Brazil nuts • 30g Vegan feta • 5g MCT oil • 15g Flax oil • 10g Olives • 20g Pepper yellow • 30g Spinach baby • 5g Spring onion • 30g Cherry tomato • 20g Red pepper • Vinegar/herbs	• Rhubarb muffin	• 5g MCT • 20g Coconut Oil • 50g Tofu • 100g Cauliflower • 50g Elmlea plant cream • 10g Meridian peanut butter • 30g Spinach • 5g Spring onion	• Tea 6 x mugs • Water 1.5 litres • Red wine x2 small glasses • + 400ml Alpro soya light milk with meals

1+ weeks

THE PRACTICALITIES

PROTEIN

Breakfast – Again, kept very simple with the porridge.

Day 1

- All went well up until lunch time. I planned a salad with Vegan feta, it was only when I looked at the nutritional values that I was shocked to find it contained no protein, it also contained some carbohydrate, 2g in 19g so less salad!
- The nuts and sesame seeds added a bit of protein but really not enough. The salad was delicious; however, it seems the sesame seeds and I were incompatible. I did manage an afternoon snack but by teatime I was still tasting sesame seeds felt nauseous and very uncomfortable.
- The thought of eating Tempeh (fermented tofu) for tea was not helping. I just tried to drink more and took Movicol.

CLICK HERE TO VIEW: VIOLIFE GREEK WHITE BLOCK VEGAN ALTERNATIVE TO CHEESE 230G

FAT

I don't seem to have any problem getting fat in, along with some of my own to burn! However, it became clear that it would be good to include some MCT fat to allow for more CHO! Increasing CHO would also boost protein intake from vegetables, fruit and even perhaps a small amount of additional pulses.

NUTRITIONAL ANALYSIS

- Average: 1638kcal.
- Average daily intake 22.1g CHO, 47g protein, 143g Fat. Ketogenic Ratio 2:1
- I had no ketone strips, but I did check my breath ketones. I was in ketosis.
- Vitamins and minerals – most concerning was a deficiency in selenium and iodine, especially as I had included seaweed on day 3 and brazil nuts on day 5. Calcium was a bit high; I think from the amount of Soya milk I used.

The vegan cheese and the egg replacer, did not contain protein.

I was quickly learning that nuts, seeds and the minimal amount of carbohydrate allowed on KDT would only equate to a small percentage towards my protein intake. I was not keen to eat tofu every day. Also, even the tofu contributed to the carbohydrate intake, even a gram of carbohydrate was a big difference when I was aiming for around 5g in a meal!

The edamame bean pasta was useful to give my protein a boost.

I had thought I could use the Quorn from veggie week for a meal, but the Quorn pieces and mince I used in veggie week contained egg, so were not vegan friendly. Some Quorn is fine to use, so check the labels.

CLICK HERE TO VIEW: QUORN VEGAN PIECES 280G - TESCO GROCERIES

I realised that the soya milk as a drink could be used to increase my protein intake. I also ordered some soya protein powder.

I tried adding the powder to porridge and mixed in soya milk to make a shake, but I was not keen. That's when the protein biscuits came in. They were crunchy, tasted good and with a drink of soya milk alongside contributed 10g protein just in a snack.

An alternative could have been pea protein, also low in CHO.

CLICK HERE TO VIEW: PULSIN PEA PROTEIN ISOLATE POWDER 250G - TESCO GROCERIES

There did not seem to be a prescription protein powder that was vegan friendly. They contained either milk protein (Protifar) Hydrolysed collagen or gelatine (Prosourse).

CLICK HERE TO VIEW: VEGAN KETO PROTEIN OPTIONS: TOP 30 FOOD SOURCES

REFLECTIONS ON KETO VEGAN WEEK

I was surprised at what a difference following vegan keto was as opposed to following veggie keto. It didn't help that the aftereffects of the sesame seeds impacted on the rest of the week! I think I would have built up the MCT oil to allow for an increase in CHO, but I didn't think my stomach would tolerate an increase. It was a shame, but I decided to stop after day 5 to allow by stomach to settle down. To be honest from day 1 it just felt like I was forcing food in. I think I would have been fine if I hadn't eaten the sesame seeds. I wonder if intolerance issues do sometimes effect a person's ability to tolerate KDT if undiagnosed?

I hadn't realised quite what a struggle it would be to find enough protein. I certainly had a lot of soy. Pea protein unfortunately was not an option for me.

I also thought afterwards I could have used some of the online bread that is high in protein. When I checked though some contain egg or milk products so best to check. The chia seed Sukrin mix seems ok, though not a huge protein content, in fact Mo's vegan rolls were higher in protein!

CLICK HERE TO VIEW: SUKRIN-CHIA-BREAD-MIX

Despite trying hard to cover all the vitamins & minerals I still came out with low levels. The prescription vitamins/minerals are not vegan friendly. There are however over the counter options available. These would need to be checked by your dietitian to ensure that individual needs are covered.

CLICK HERE TO VIEW: CHEWWIES - VEGAN VEGETARIAN HALAL SUGAR FREE VITAMINS

CLICK HERE TO VIEW: NATURES AID KIDZ MULTI-VITAMINS & MINERALS, NATURES AID UK

CLICK HERE TO VIEW: VEGAN MULTIVITAMINS & MINERALS WITH HIGH STRENGTH VITAMIN

Iodine can be included by adding seaweed into the diet. The easy option is to use the snack packs like I did, but if you forage yourself you need to know which seaweed and what to do with it.

CLICK HERE TO VIEW: 10 DIFFERENT TYPES OF EDIBLE SEAWEED

The fermented tofu (tempeh) was my least favourite meal, celeriac steak fried in Pure and then baked in the oven as a pizza base was delicious!

I realised some of the Natural ketosis Fatt bars are vegan friendly so would have been a great snack whilst out and about. There are also vegetarian and vegan low CHO options within their meals, they are aimed at weight loss and would need fat/protein added. Perhaps pea protein powder would work in soup, fat could be easily added or serve with Mo's rolls? Maybe useful for back up during illness or hospital admissions.

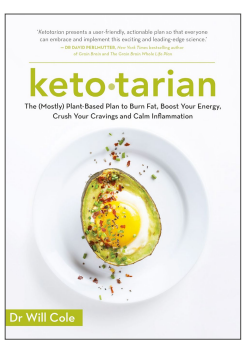
CLICK HERE TO VIEW: SNACKS - DELIVERED REAL FOOD DIET | NATURAL KETOSIS COMPANY

CLICK HERE TO VIEW:CHILLI BEAN SOUP - LUNCH | NATURAL KETOSIS

CLICK HERE TO VIEW: COCONUT & KALE SOUP - LUNCH | NATURAL KETOSIS

I found this book to be very informative. I did think that the ingredients suggested on a budget would be a stretch and that Dr Cole must have spare room to fit all the supplements in though.

CLICK HERE TO VIEW THIS BOOK ON AMAZON



I found following vegan KDT challenging, mostly I think because I was trying to include all essential nutrients in an already restricted KDT. It certainly requires expert training/support. With such a diverse population in UK further resources/training would I think be helpful?

One thing I am sure of is that if you are following a medical KDT you need a ketogenic team to support you, supporting KDT alongside further restriction to food, makes it all the more essential, to avoid serious vitamin/mineral deficiencies.