

**Thank you!**

# **What about fibre?**

Public Health Collaboration

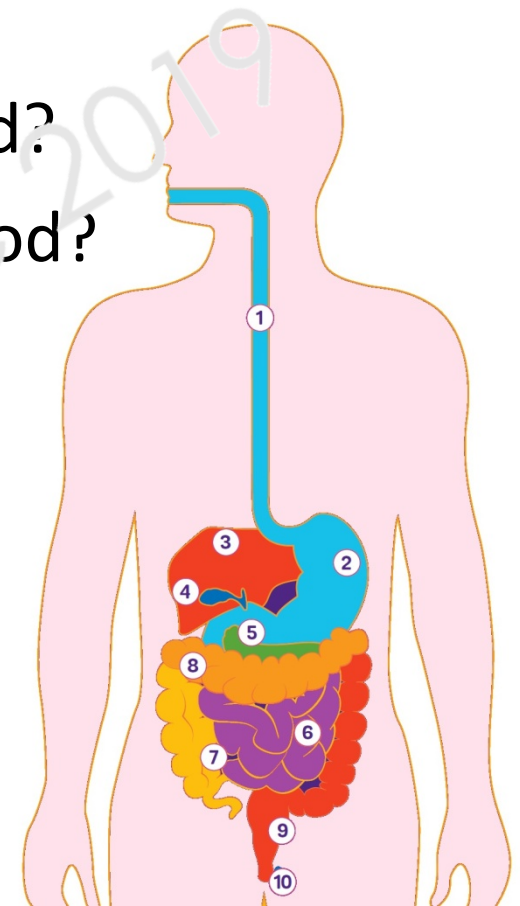
**May 2019**

**Dr. Zoë Harcombe, Ph.D**

Refs are on <http://www.zoeharcombe.com/PHC19>

# By the end...

- What is fibre? How much do we need?
- What's the origin of the belief it's good?
- What are the guidelines?
- What is the evidence?
- What are the claimed mechanisms?
- Can it harm?
- What's really going on?
- The bottom line



# What is fibre?

## Carbohydrates 101

Single-sugars:



Glucose



Fructose

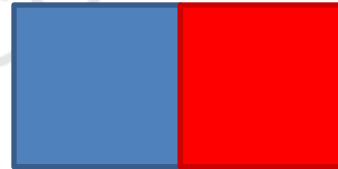


Galactose

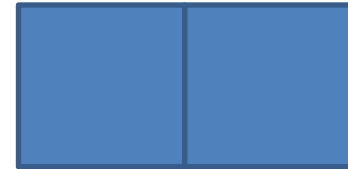
Two-sugars:



Sucrose



Lactose

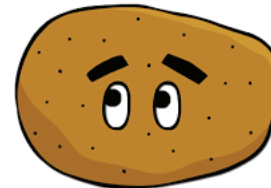


Maltose

Many-sugars:  
(Digestible)



Glycogen



Starch

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# What is fibre?

## Carbohydrates 101

Single-sugars:



Glucose



Fructose



Galactose

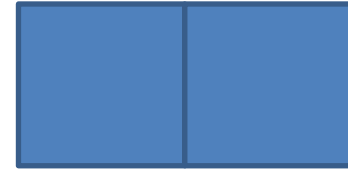
Two-sugars:



Sucrose



Lactose



Maltose

Many-sugars:  
(Indigestible)



Soluble



Insoluble

# How much do we need?

## Carbohydrates 101

- "The **lower limit of dietary carbohydrate** compatible with life **apparently is zero**, provided that adequate amounts of protein and fat are consumed."
- "Essential Nutrient – A vitamin, mineral, fatty acid, or amino acid required for normal body functioning that either cannot be synthesized by the body at all, or cannot be synthesized in amounts adequate for good health, and thus must be obtained from a dietary source. Other food components, such as **dietary fiber, while not essential**, also are considered to be nutrients."
- De facto fibre is non-essential.

**The end!**  
**Thank you for listening**

Refs are on <http://www.zoeharcombe.com/PHC19>

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# What's the origin...

...of the belief it's good?



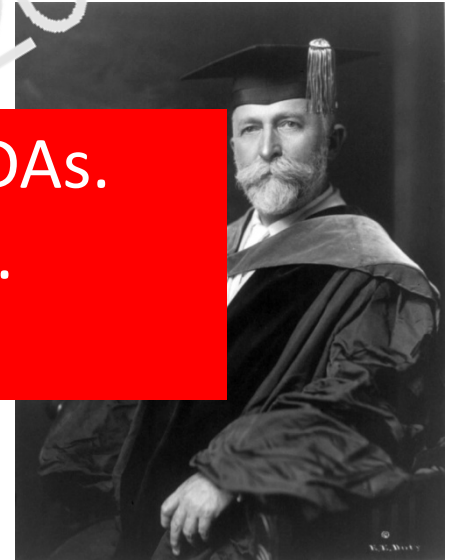
Dietitians. Cereal companies. SDAs.  
Vegans. Garden of Eden diet.  
EAT/Lancet diet.



Sylvester Graham  
(1794-1851)



Denis Burkitt (1911-1993)



John Harvey Kellogg  
(1852-1943)

# What are the guidelines?

## Dietary Guidelines for Americans

1977: “Increase consumption of fruit and vegetables and whole grains.”

2000: “Choose a variety of grains daily, especially whole grains.”

**There is no evidence base for these targets**

2005: 14g/day per 1,000 calories.

DGAs 2015-2020							
g/day	Age 1-3	Age 4-8	Age 9-13	14-18	19-30	31-50	51+
Male	14	19.6	25.2	30.8	33.6	30.8	28
Female	14	16.8	22.4	25.2	28	25.2	22.4

UK: Age 2-5 (15g) Age 5-11 (20g) Age 11-16 (25g) 16+ (30g)










# What are the guidelines?

How can we get 30g fibre?

Food (portion)	Fibre	Calories	Carbs (g)	Sugar (g)
Bran Flakes (30g)	5.3	96	24.1	5.7
Banana (medium 118g)	3	105	27	14.4
Apple (100g)	2.4	52	13.8	10.4
Walnuts (28g)	1.9	183	3.8	0.7
Whole meal bread (slice 23g)	1.9	69	11.6	1.6
Baked potato (medium 173g)	3.8	161	36.6	2
Whole W spaghetti (boiled 140g)	6.3	174	37.2	1.1
Baked beans (can 100g)	5.5	105	20.5	7.8
Total	30	945	175	44

# What are the guidelines?

BRISTOL STOOL CHART			
	Type 1	Separate hard lumps	<b>SEVERE CONSTIPATION</b>
	Type 2	Lumpy and sausage like	<b>MILD CONSTIPATION</b>
	Type 3	A sausage shape with cracks in the surface	<b>NORMAL</b>
	Type 4	Like a smooth, soft sausage or snake	<b>NORMAL</b>
	Type 5	Soft blobs with clear-cut edges	<b>LACKING FIBRE</b>
	Type 6	Mushy consistency with ragged edges	<b>MILD DIARRHEA</b>
	Type 7	Liquid consistency with no solid pieces	<b>SEVERE DIARRHEA</b>

# What is the evidence?

## RCT evidence

Lancet. 1989 Sep 30;2(8666):757-61.

**Effects of changes in fat, fish, and fibre intakes on death and myocardial reinfarction: diet and reinfarction trial (DART).**

Burr ML<sup>1</sup>

⊕ Auth

Abstract

A random

myocard

factors: a

increase

small re

compare

Subjects

from ischaemic heart disease was not significantly affected by any of the dietary regimens. A modest intake of fatty fish (two or three portions per week) may reduce mortality in men who have recovered from MI.

**2 years. 2,033 men.**  
**Fat/fish/fibre (18g)**  
**All deaths: 123 (12.1%) fibre; 101 (9.9%) ctrl**  
**Heart deaths: 109 (10.7%) fibre; 85 (8.4%) ctrl**

# What is the evidence?

## Cochrane

Cochrane Database of Systematic Reviews

### Dietary fibre for the primary prevention of cardiovascular disease

Cochrane Systematic Review - Intervention | Version published: 07 January 2016 [see what's new](#)

Cochrane Database of Systematic Reviews

Whole grain foods for the prevention of cardiovascular disease

**“Properly designed long-term randomised controlled trials are needed”**

Cochrane Database of Systematic Reviews

### Whole grain foods for the prevention of type 2 diabetes mellitus

Cochrane Systematic Review - Intervention | Version published: 23 January 2008 [see what's new](#)



32

[View article information](#)

✉ Marion Priebe | Jaap van Binsbergen | Rien de Vos | Roel J Vonk

[View authors' declarations of interest](#)

# What is the evidence?

## Umbrella Review

### Dietary fiber and health outcomes: an umbrella review of systematic reviews and meta-analyses

Nicola Veronese ✉, Marco Solmi, Maria Gabriella Caruso, Gianluigi Giannelli, Alberto R Osella, Evangelos Evangelou, Stefania Maggi, Luigi Fontana, Brendon Stubbs, Ioanna Tzoulaki

*The American Journal of Clinical Nutrition*, Volume 107, Issue 3, 1 March 2018, Pages 436–444, <https://doi.org/10.1093/ajcn/nqx082>

**Published:** 16 March 2018 **Article history** ▼

18 meta-analyses; 21 outcomes; 3/21 “convincing evidence.”

18/21 no “convincing evidence.”

# What is the evidence?

## Epidemiological

1) Association not causation (Bradford Hill):

- Reynolds (2019) 15% RR ACM – 30g vs. 5g

2) Relative not absolute risk:

- Yar

Incident rate 0.75%. RR 0.75% vs. 0.05%

**Is fibre a maker, or a marker, of a healthy person?**

3) The healthy person confounder:

- Xu (key in Reynolds): 2x alcohol; 1.5x obese; 1.5x lowest activity; 1.5x lowest education

# What is the evidence?

## The Reynolds paper got me thinking...

THE LANCET

Log in

ARTICLES | VOLUME 393, ISSUE 10170, P434-445, FEBRUARY 01, 2019

### Blow to low carb diet as landmark study finds high fibre cuts heart disease risk

Review commissioned by WHO says fibre in 'good' carbohydrates such as wholegrain bread and oats has protective effect

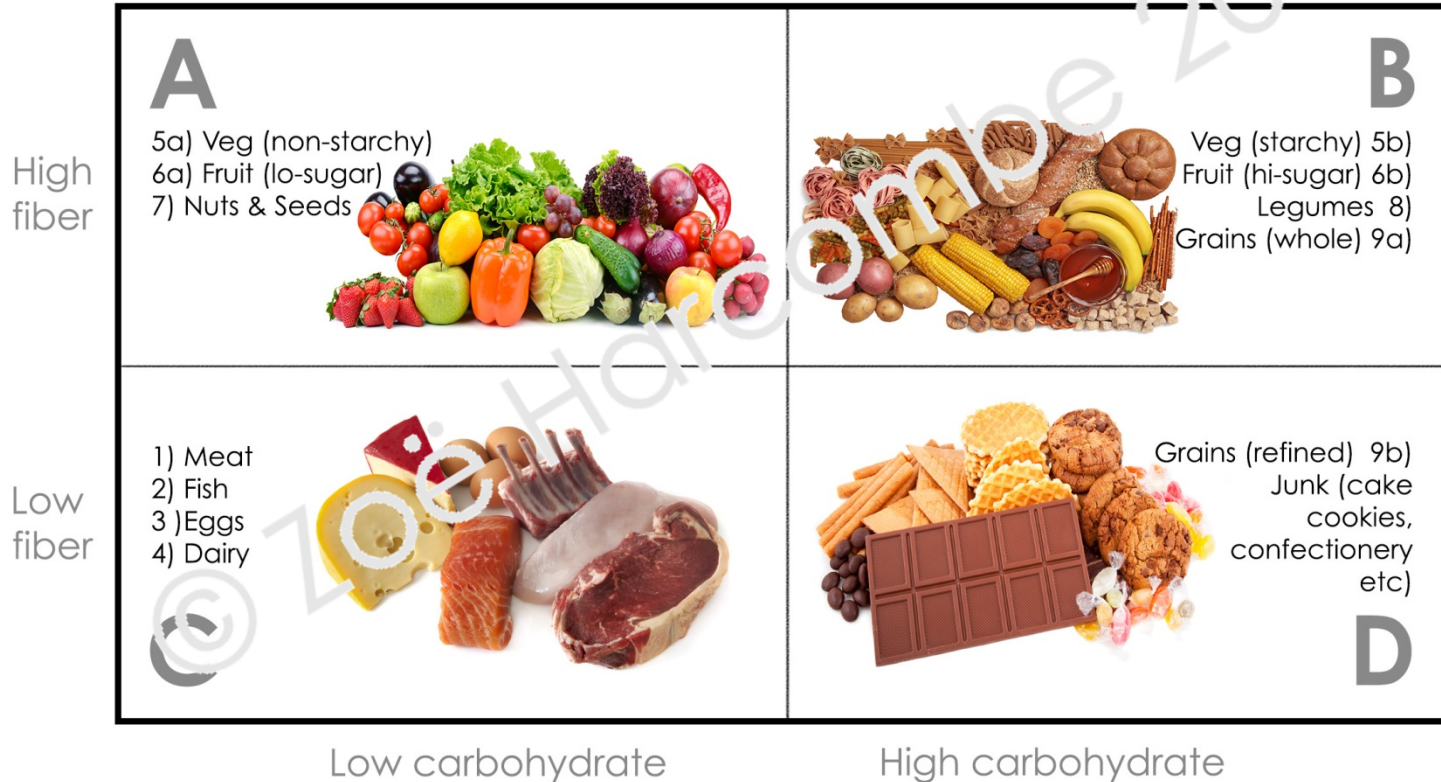
Evelyn Mente, MDiet • Lisa Te Morenga, PhD

Published: January 10, 2019 • DOI: [https://doi.org/10.1016/S0140-6736\(18\)31809-9](https://doi.org/10.1016/S0140-6736(18)31809-9)

 Check for updates

# What is the evidence?




## The Carb vs Fibre Matrix





# What is the evidence?

## The Carb vs Fibre Matrix

<p>High</p>	<p><b>A</b></p> <p>5a) Veg (non-starchy) 6a) Fruit (lo-sugar)</p> 		<p><b>B</b></p> <p>Veg (starchy) 5b) Fruit (hi-sugar) 6b) Legumes 8) Grains (whole) 9a)</p>
			<p>Grains (refined) 9b) Junk (cake, cookies, confectionery etc)</p> <p><b>D</b></p>

High carbohydrate

# What is the evidence?

## The Carb vs Fibre Matrix

High  
fiber

### A

- 5a) Veg (non-starchy)
- 6a) Fruit (lo-sugar)
- 7) Nuts & Seeds



### B

- 5b) (starchy)
- 6b) (sugar)
- 8) (grains)
- 9a) (fruit)

**Does fibre make people healthy? Or do healthy people eat fibre?**

Low  
fiber

- 2) Fish
- 3) Eggs
- 4) Dairy



- (cake)
- cookies,
- confectionery
- etc)

### D

Low carbohydrate

High carbohydrate

# What are the claimed mechanisms?

Fibre might...

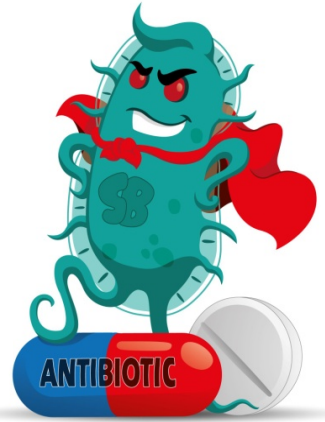
- 1) ... slow down glucose absorption. **Yes but: No/low carb foods are better still** ...
- 2) ... lower cholesterol. **Yes but: Plant sterols lower cholesterol & increase CHD** ...
- 3) ... improve blood sugar control. **Yes but: 1 conflicted study showed apples better than juice**
- 4) ... improve gut health. **Yes but: This isn't a case for fibre *per se* & animal foods have more micronutrients** ...
- 5) ... improve gut health. **Yes but: 1) avoid carcinogens 2) nutrient absorption 3) if empty bowel is good, then fast!**
- 6) ... alter intestinal pH. **Yes but...** ...



# What creates optimal microbiota?

DO

DON'T



# Can it harm?

## The effect of reducing fibre

Online Submissions: <http://www.wjgnet.com/esps/>  
wjg@wjgnet.com  
doi:10.3748/wjg.v18.i33.4593

*World J Gastroenterol* 2012 September 7; 18(33): 4593-4596  
ISSN 1007-9327 (print) ISSN 2219-2840 (online)  
© 2012 Baishideng. All rights reserved.

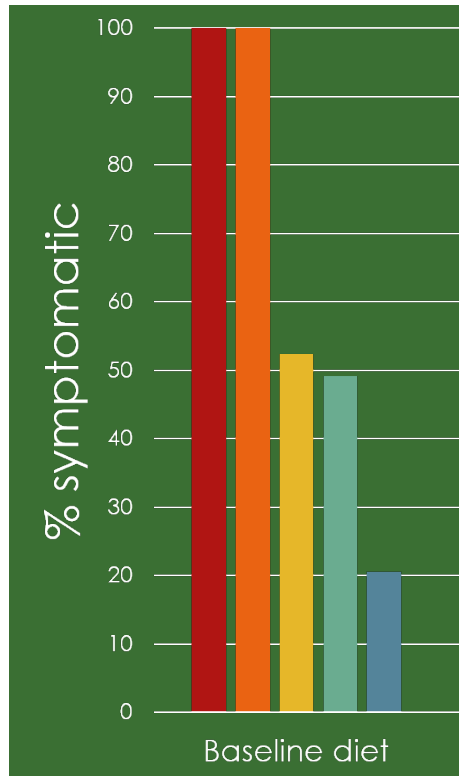
BRIEF ARTICLE

### **Stopping or reducing dietary fiber intake reduces constipation and its associated symptoms**

Kok-Sun Ho, Charmaine You Mei Tan, Muhd Ashik Mohd Daud, Francis Seow-Choen

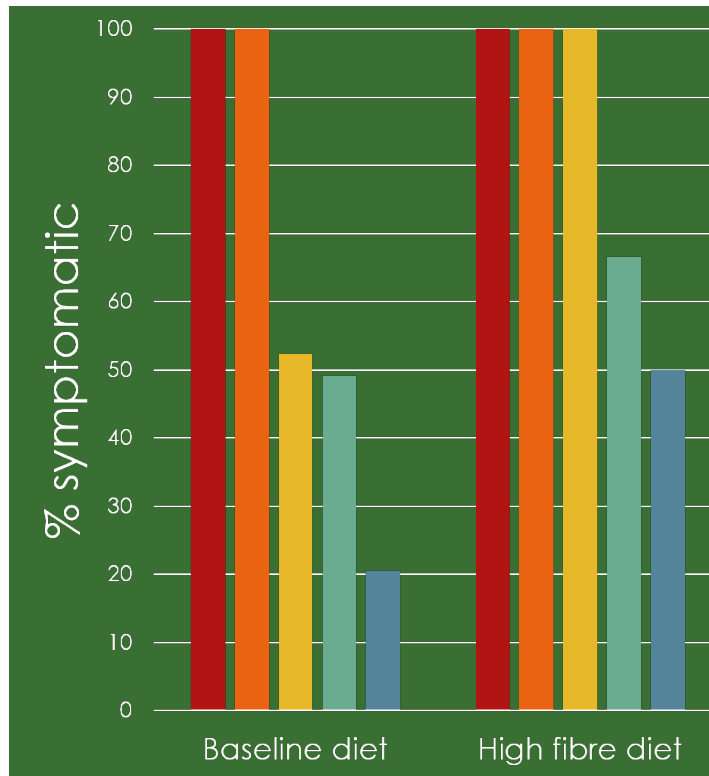
# Can it harm?

## The effect of reducing fibre



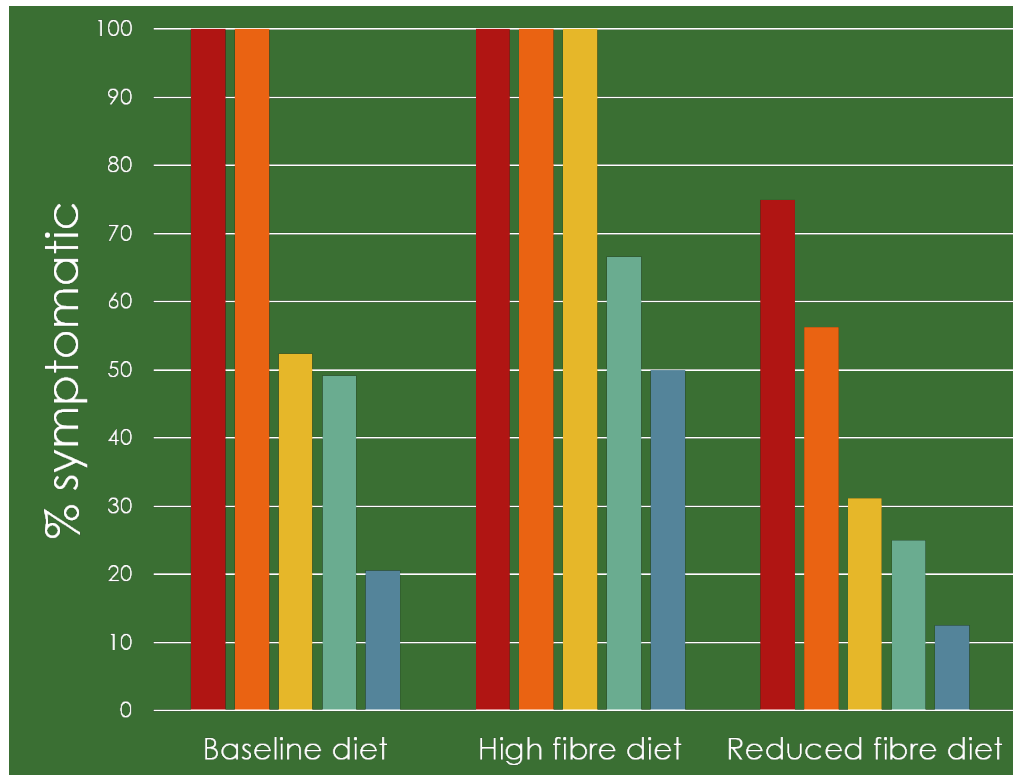
# Can it harm?

## The effect of reducing fibre



# Can it harm?

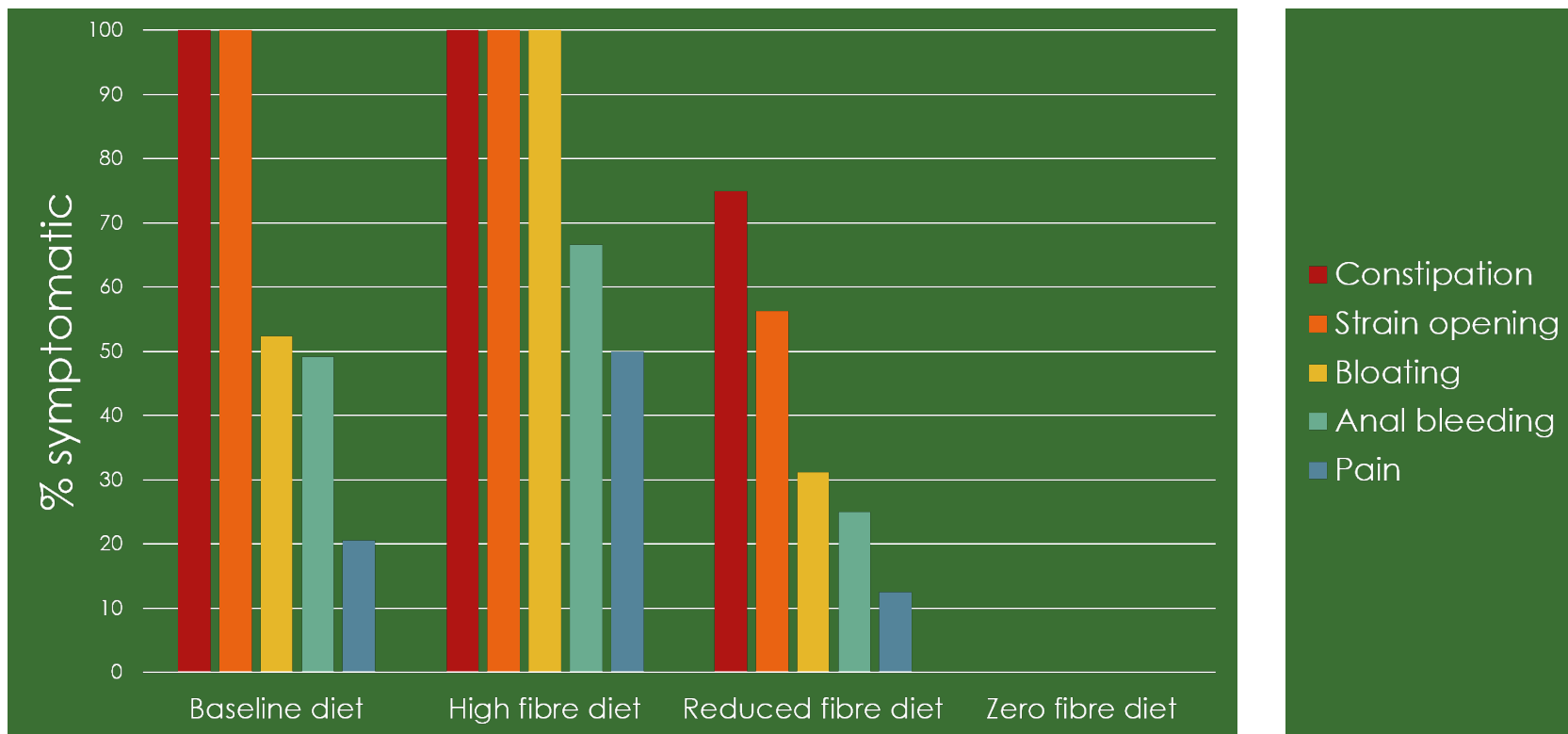
## The effect of reducing fibre





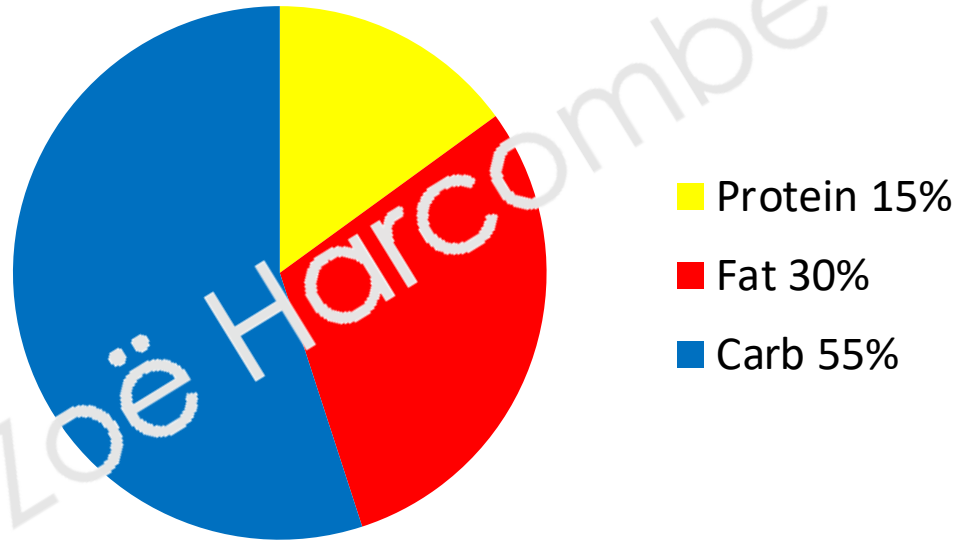
# Can it harm?

## The effect of reducing fibre



# What's really going on?

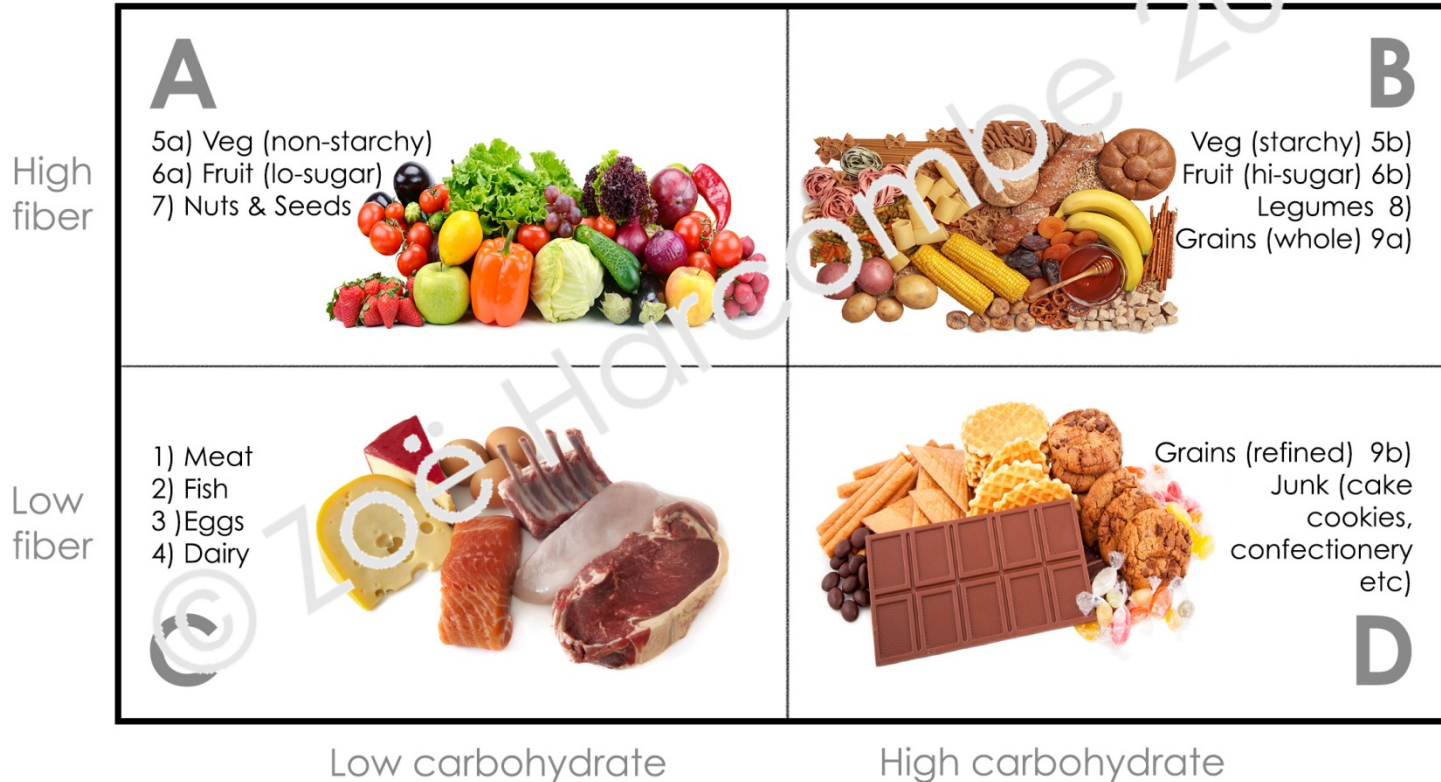
## When carbs are non-essential...



**“Increase carbohydrate consumption to account for 55 to 60% of calorie intake”**

# What's really going on?

## The Carb vs Fibre Matrix



# What's really going on?

## How low carbers get fibre

Food (100g unless shown)	fibre	Calories	Carbs (g)	Sugar (g)
Flaxseeds (33g)	9.1	172	10	0.5
Alfalfa raw	1.9	23	2.1	0.2
Asparagus boiled	1.6	18	1.9	0.3
Artichokes boiled	8.5	53	12	1
Chinese cabbage boiled	1.7	14	2.4	0.1
Cauliflower boiled	2.3	23	4.4	2.1
Blackberries	5.3	43	10.2	4.9
<b>Total</b>	<b>31</b>	<b>352 (945)</b>	<b>43 (175)</b>	<b>9 (44)</b>

# What's really going on?

## How low carbers get fibre



fibre	Calories
9.1	172
1.9	23
1.6	18



Chinese cabbage boiled

Cauliflower boiled

Blackberries

Total

2.4

0.1

4.4

2.1

10.2

4.9

43

9

# What's really going on?

## How low carbers get fibre

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Flaxseeds (33g)	9.1	172	10	0.5
Alfalfa raw	1.9	23	2.1	0.2
Asparagus				0.3
Artichoke				1
Chinese cabbage				0.1
Cauliflower boiled	2.3	23	4.4	2.1
Blackberries	5.3	43	10.2	4.9
Total	31	352	43	9

**Harvard scale: 1g fibre for 10g carb**  
**Low carb/high fibre wins every time**

# The bottom line

How well did we do?!

- Is fibre essential? No!
- Is 14g/day/1,000 cals evidence-based? No!
- Is there any RCT or Cochrane evidence? No!
- Is there a robust mechanism for benefit? No!
- Is a low carb diet necessarily a low fibre diet? No!
- Beans beans, good for the heart...  
the more you eat, the more you... !!!!

**The end!**  
**Thank you for listening**

Refs are on <http://www.zoeharcombe.com/PHC19>

**May 2019**

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