“Why we need healthy new proteins with a low environmental impact”

Who is Tim Finnigan???

- Married, two children (grown up)

Who is Tim Finnigan???

- Married, two children (grown up)
- Likes running up hills and likes a pint
- 30 years R&D in Food and Drink
- PhD Canola protein, Government food research, APV, General Foods and...

I'D LIKE TO LOOK AT THREE THINGS

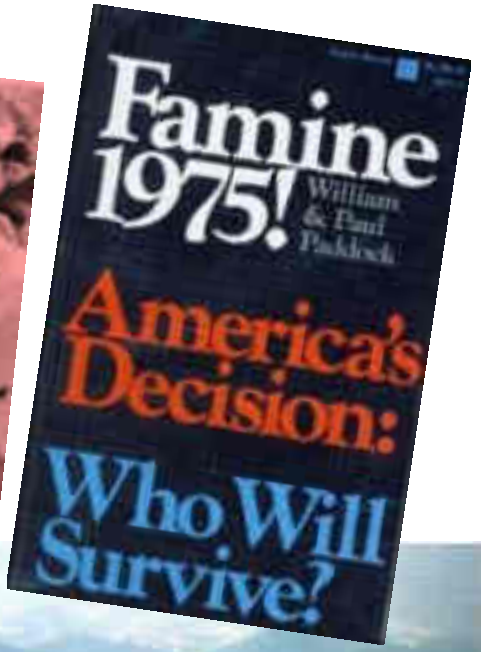
- WHY WE NEED HEALTHY NEW PROTEINS WITH A LOW ENVIRONMENTAL IMPACT.
- THE GOOD NEWS THAT 'IT CAN BE DONE' - QUORN AS AN EXAMPLE
- WHAT IS QUORN AND HOW IS IT GROWN

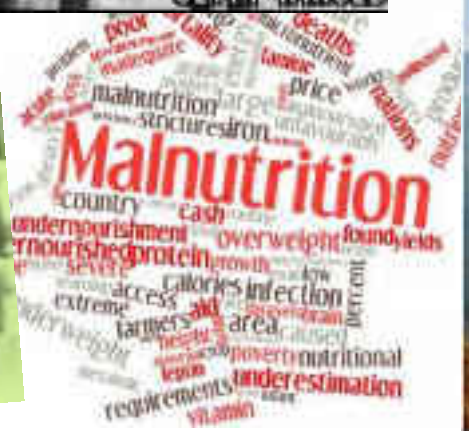
But First some context……..

The 1960s was a time of huge achievements...

The Green Revolution

….And growing concerns



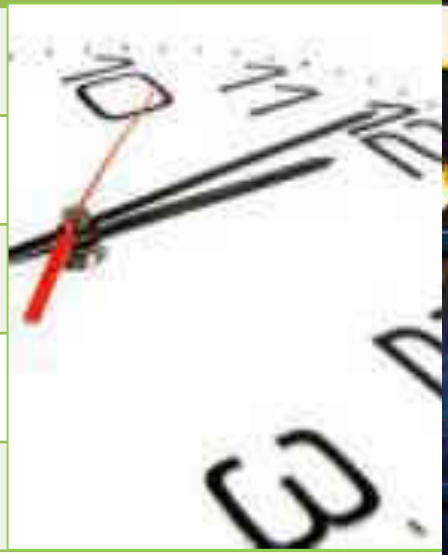


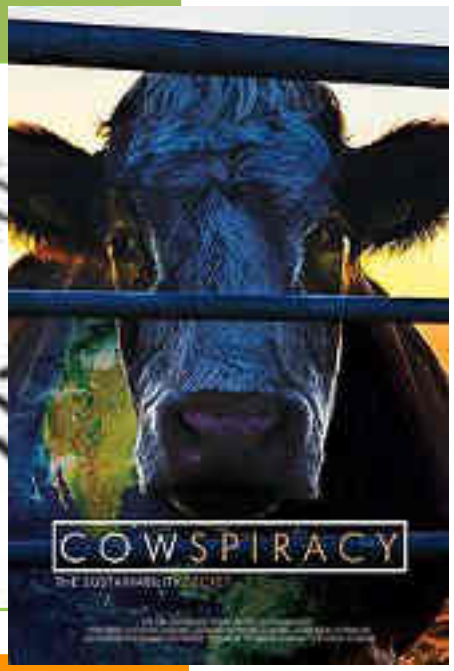
Inter-generational equity

From 1964 to 1985 – time flies…….

The current context…

kens	110,000
	2,630
p	922
s	781
s	557





+ a large number of ducks, rabbits, horses, turkeys…

..3 camels and one unfortunate mule

The scale of livestock production is driven by our desire for cheaper and more plentiful meat, but there are damaging consequences, which at the moment are forecast only to intensify

Our demand for ever cheaper and more plentiful meat has a number of potentially devastating consequences…

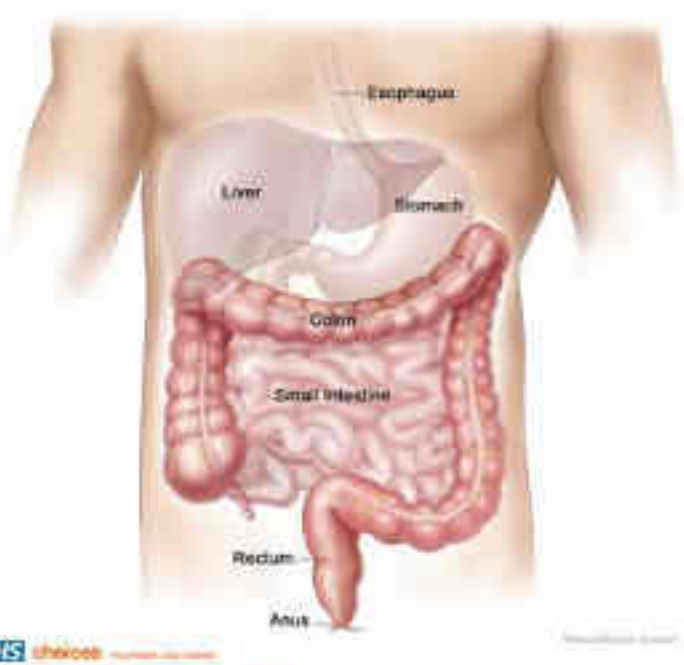
Challenge	Consequence
To feed 9bn in 2050 FAO say we need	a 60% increase in food production

some of the true costs of cheap and plentiful animal protein

Quorn are supporting bowel cancer awareness

Bowel Cancer

- Is the **third most common** cancer in the UK
- Eating 100 to 120 g of red and processed meat a day - things like ham, salami and sausages – increasing the risk of developing bowel cancer by about 25% - **we need to eat less**
- Fibre offers a protective effect – **we need to eat more** (SACN Report)



http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2121650/pdf/pmed.0040345.pdf
http://scienceblog.cancerresearchuk.org/2007/11/12/how-does-red-meat-increase-bowel-cancer-risk/
http://www.dietandcancerreport.org/?p=ER
https://www.gov.uk/government/publications/sacn-carbohydrates-and-health-report

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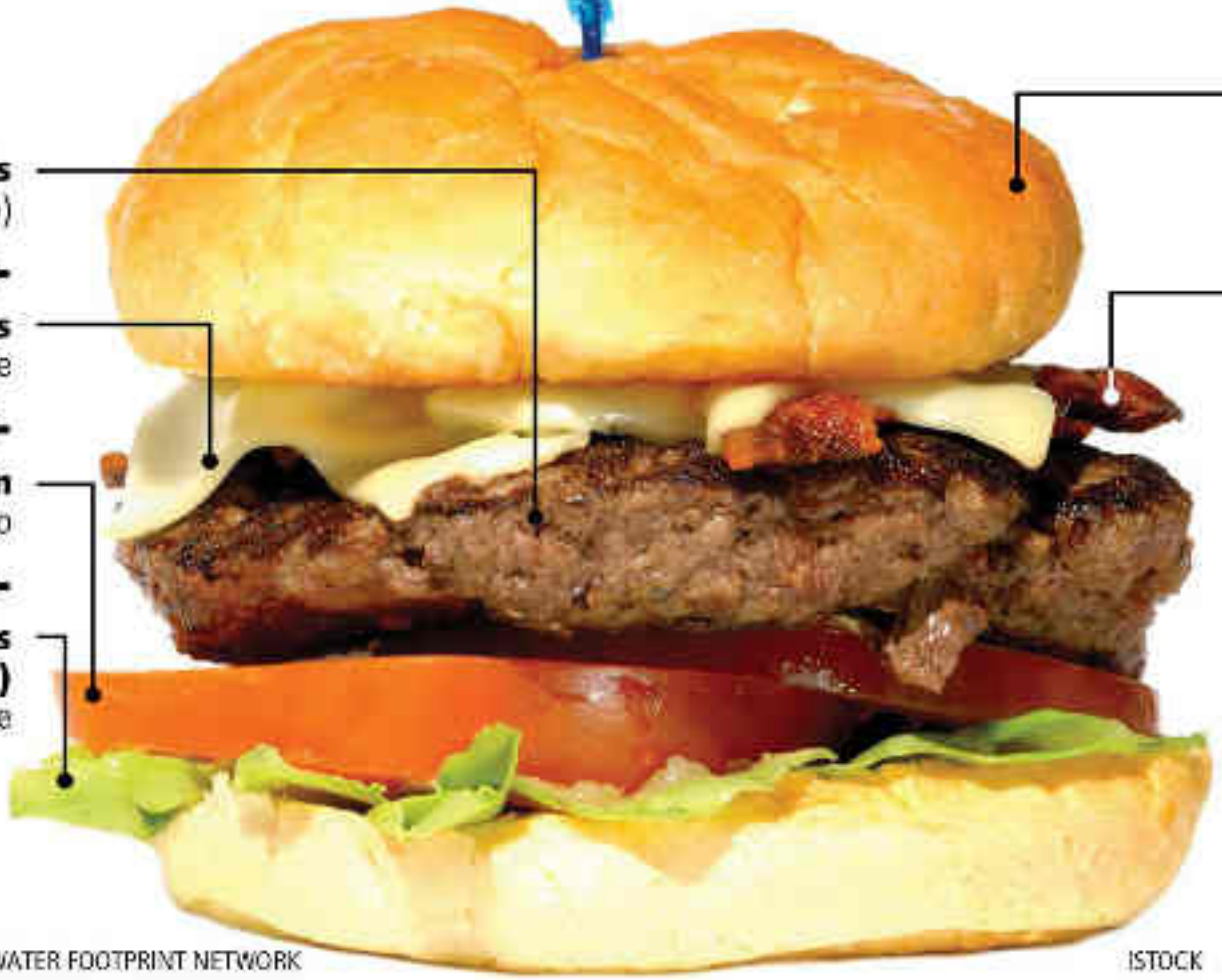
Burger breakdown



660 gallons
beef patty (1/3 lb)

+

40 gallons
1 slice cheese

+

1 gallon
2 slices tomato

+

3 cups (0.19 gallons)
1 leaf lettuce

22 gallons
bun (based on 2 slices bread)

+

108 gallons
3 slices bacon

=

831 gallons

The amount of water that would fill two modestly sized hot tubs

or

13,296 glasses of water (8 ounces in a cup)

SOURCE: THE WATER FOOTPRINT NETWORK

ISTOCK

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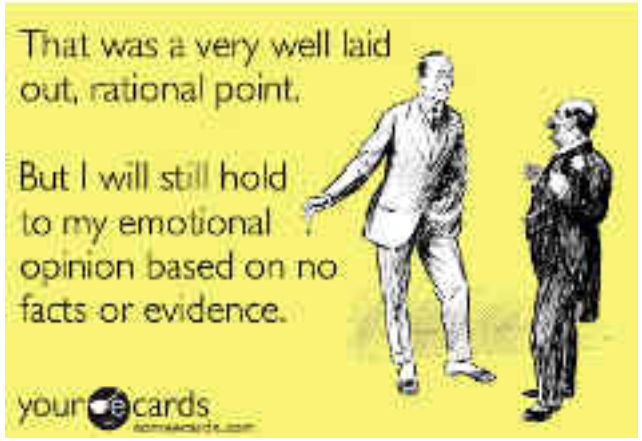
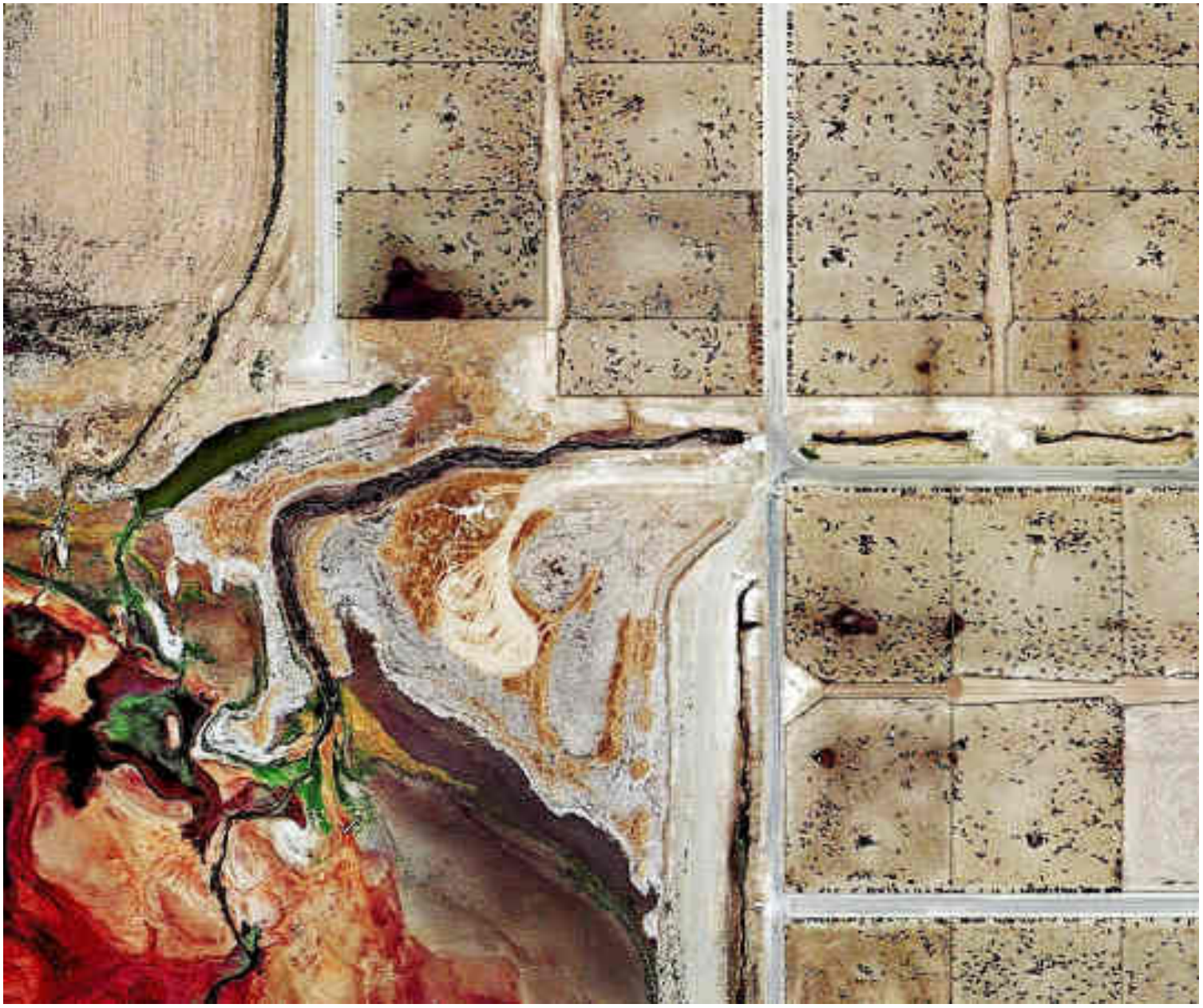




Mishka Henner

Our biggest lever that can address both environmental impact and improve our health

MEAT THE Nº 1 CONTRIBUTER

- ❑ 1/3rd water use.
- ❑ 18% -30% of global GHG emissions.
- ❑ 45% of all land.
- ❑ 91% of rainforest destruction to date (1 acre per second).
- ❑ Species loss.
- ❑ Ocean deadzones.
- ❑ Habitat destruction.
- ❑ The rise of the superbug.
- ❑ Micronutrient depletion.
- ❑ Unaccounted costs of poor health and environmental impact.
- ❑ Animal welfare and cruelty on an unprecedented scale.

Big steps toward small footprints

Quorn Foods

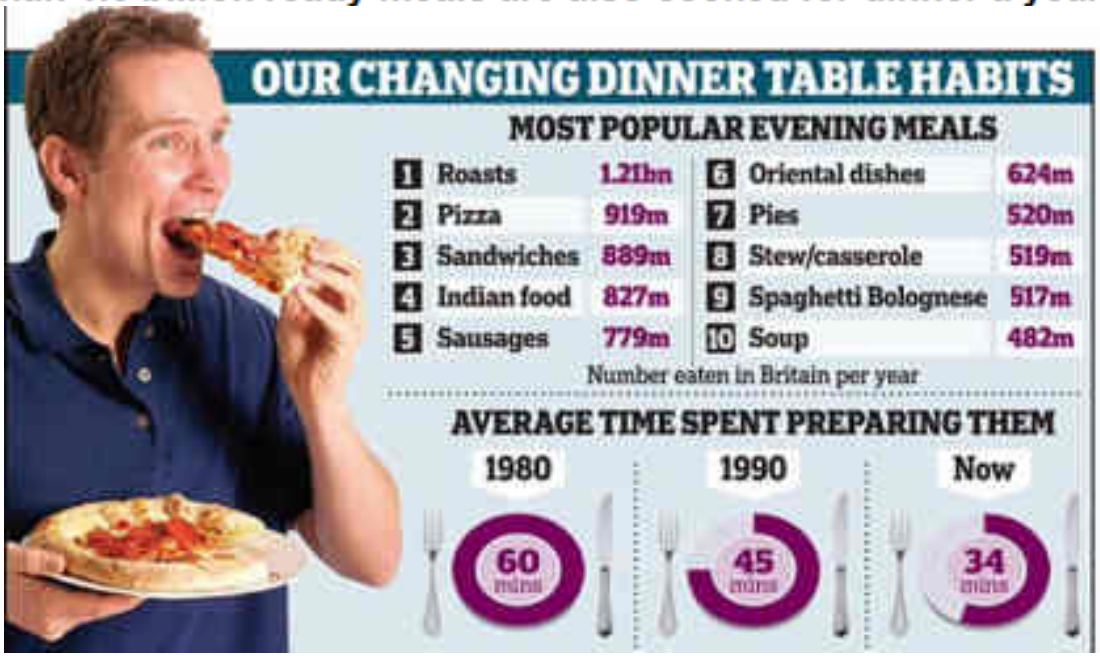
"The need for new business models that help address the 9bn challenge - including a healthy new protein with a lower environmental impact…."

Prof. Alan Knight Single Planet Living

Transition away from meat made more difficult by decline in cooking skills

Can't cook won't cook Britain: Amount of time spent cooking in UK has HALVED since 1980s and most people survive on diet of sandwiches

- The average time spent cooking an evening meal is now only 34 minutes
- This is compared to people spending a full hour in 1980
- Sandwiches are the most popular meal with 6.4 billion consumed every year
- More than 1.6 billion ready meals are also cooked for dinner a year



Easy to use, easy to enjoy – Quorn are proud to support the NHS in achieving this vision

Natural appeal

At the heart of all Quorn foods is

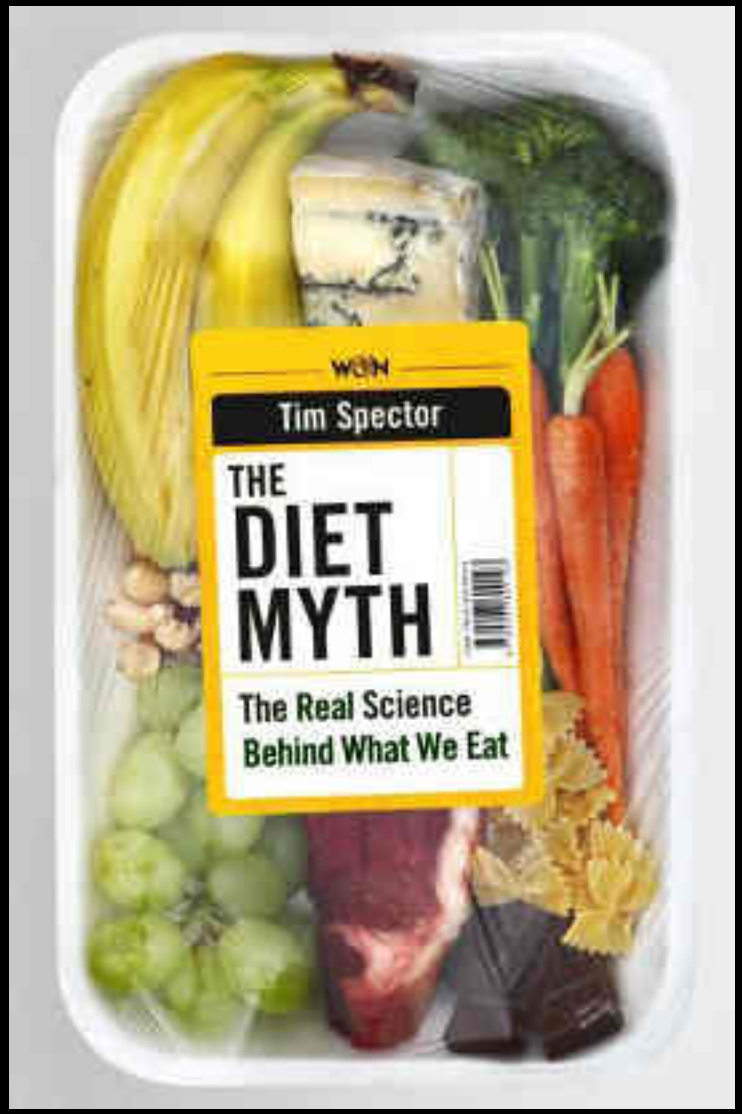
mycoprotein...

..Our 50 year 'overnight success'

So, what is it?

Quorn video

A new way of farming…….



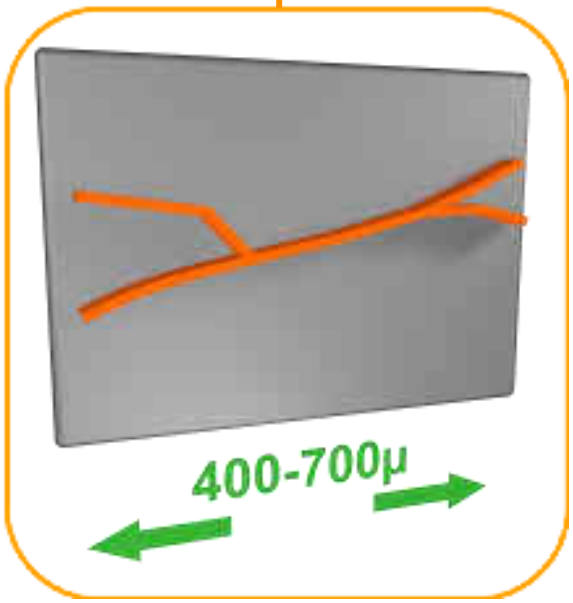
"Quorn ….began by taking the original fungi found in soil and domesticating it in the same way that our ancestors did with many plants."

Spector, T (2015) The Diet Myth. Weidenfield and Nicholson pp 137

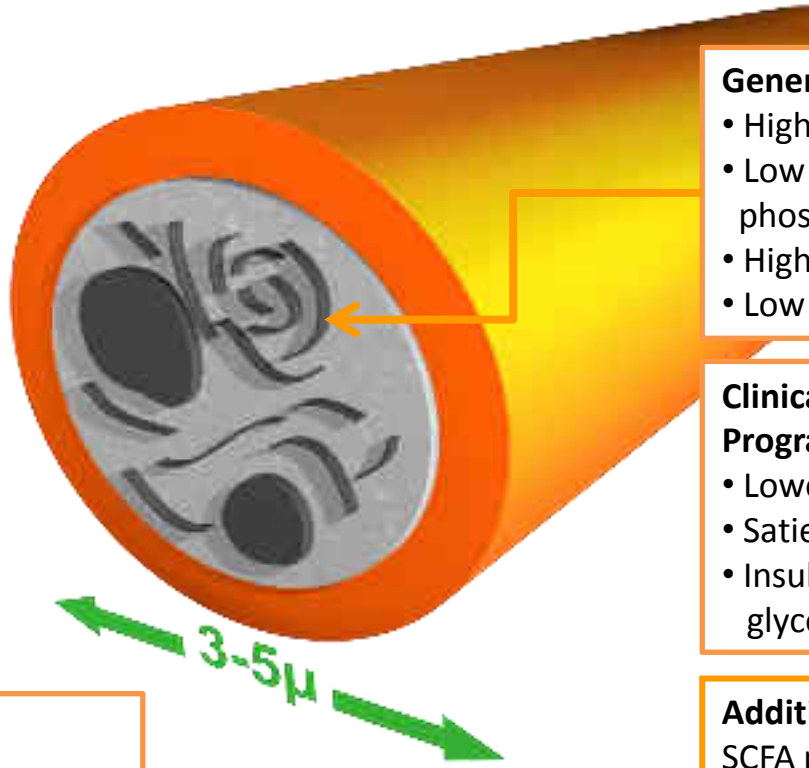
Mycoprotein as a food ingredient

BENEFITS

Physical Properties (shape)



Composition



General Nutrition
- High quality protein
- Low fat content (membrane phospho-lipids)
- High fibre (cell wall)
- Low energy density

Clinical Research Programmes
- Lowering serum cholesterol
- Satiety
- Insulinemia and glycemia in diabetics

Texture creation
- Authentic meat-like texture
- Creation of fibrosity through fibre assembly

Additional Interest
SCFA production
Fibre (chitin and ß-glucans)

Denny, A, Aisbitt, B and Lunn, J (2008) Mycoprotein and health. BNF Nutrition Bulletin 33: 298 – 310.
Bottin, J. (2014) Nutrition and Surgical Influences on appetite regulation in obese adults. PhD Thesis Imperial College London

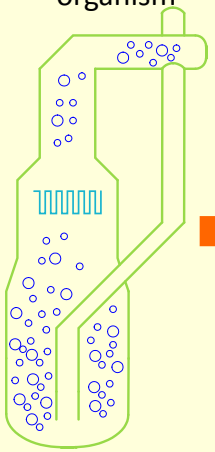
Belasis Process Overview

Raw Materials

Utilities

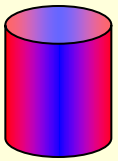
Fermentation

To grow the organism



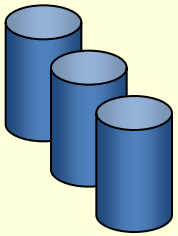
RNA Reduction

To meet specification



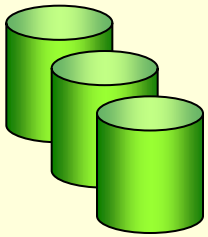
Centrifuge

Separate solids and liquid



Chillers

Harvesting of Mycoprotein paste

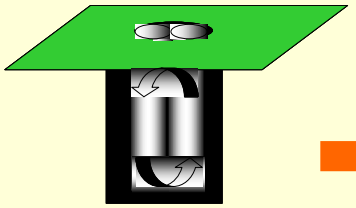


Despatch

Chilled to Stokesley for onward processing

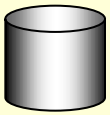
Food Production

Waste Management



Deep shaft fermenter

to process waste



Clarifier

to separate

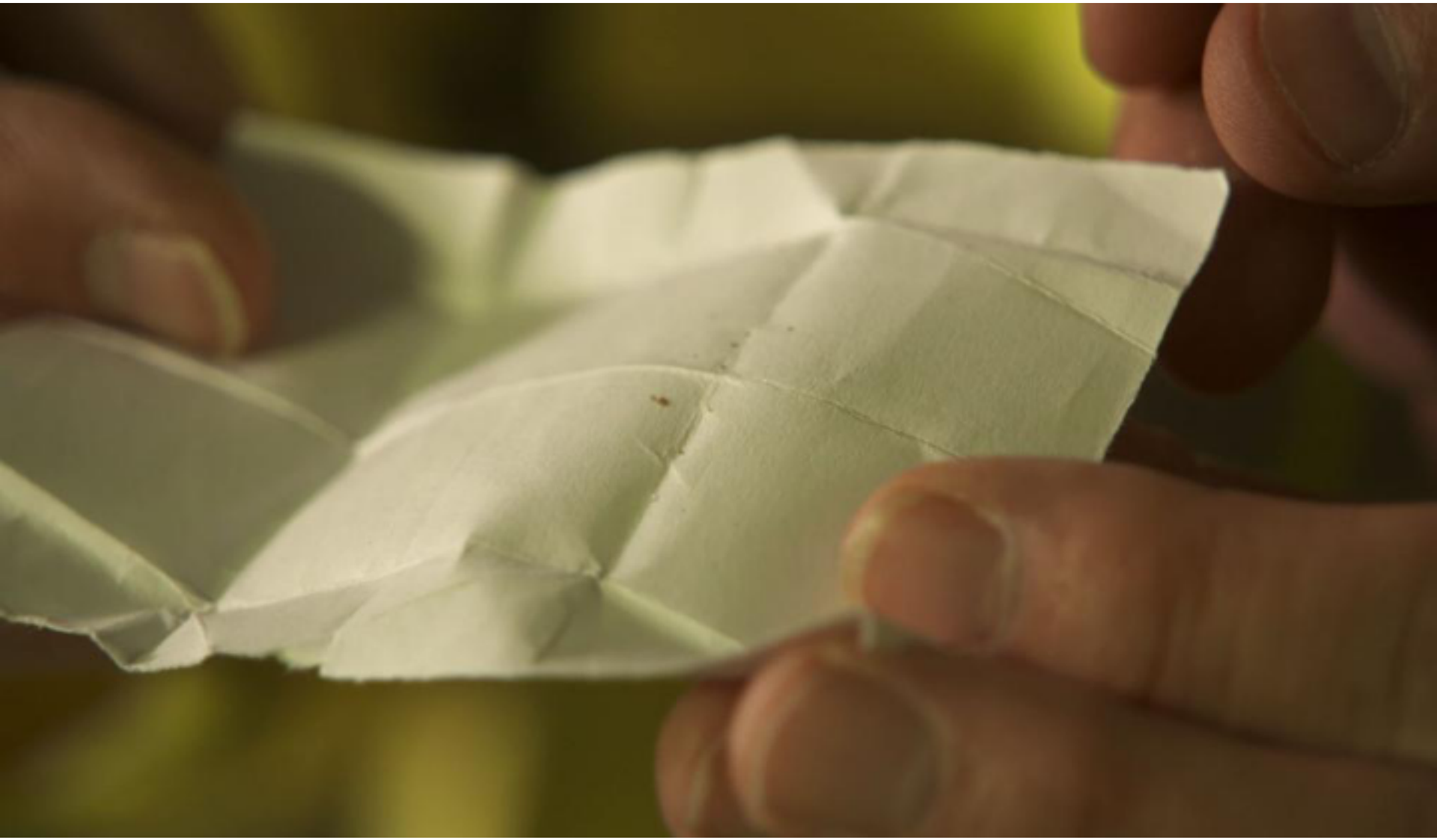
Clean Water

To River Tees

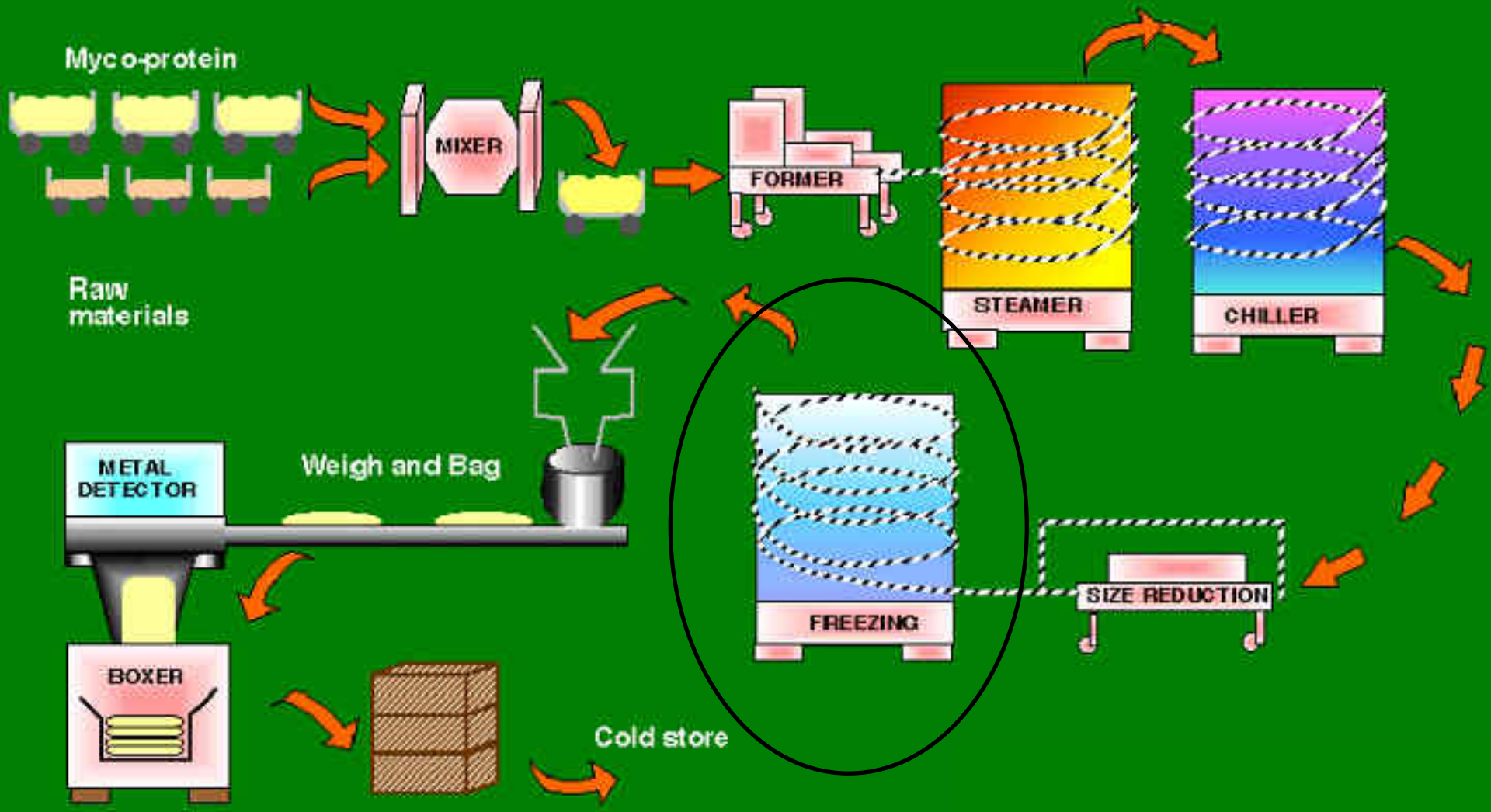
Sludge

to land injection

From Humble Beginnings

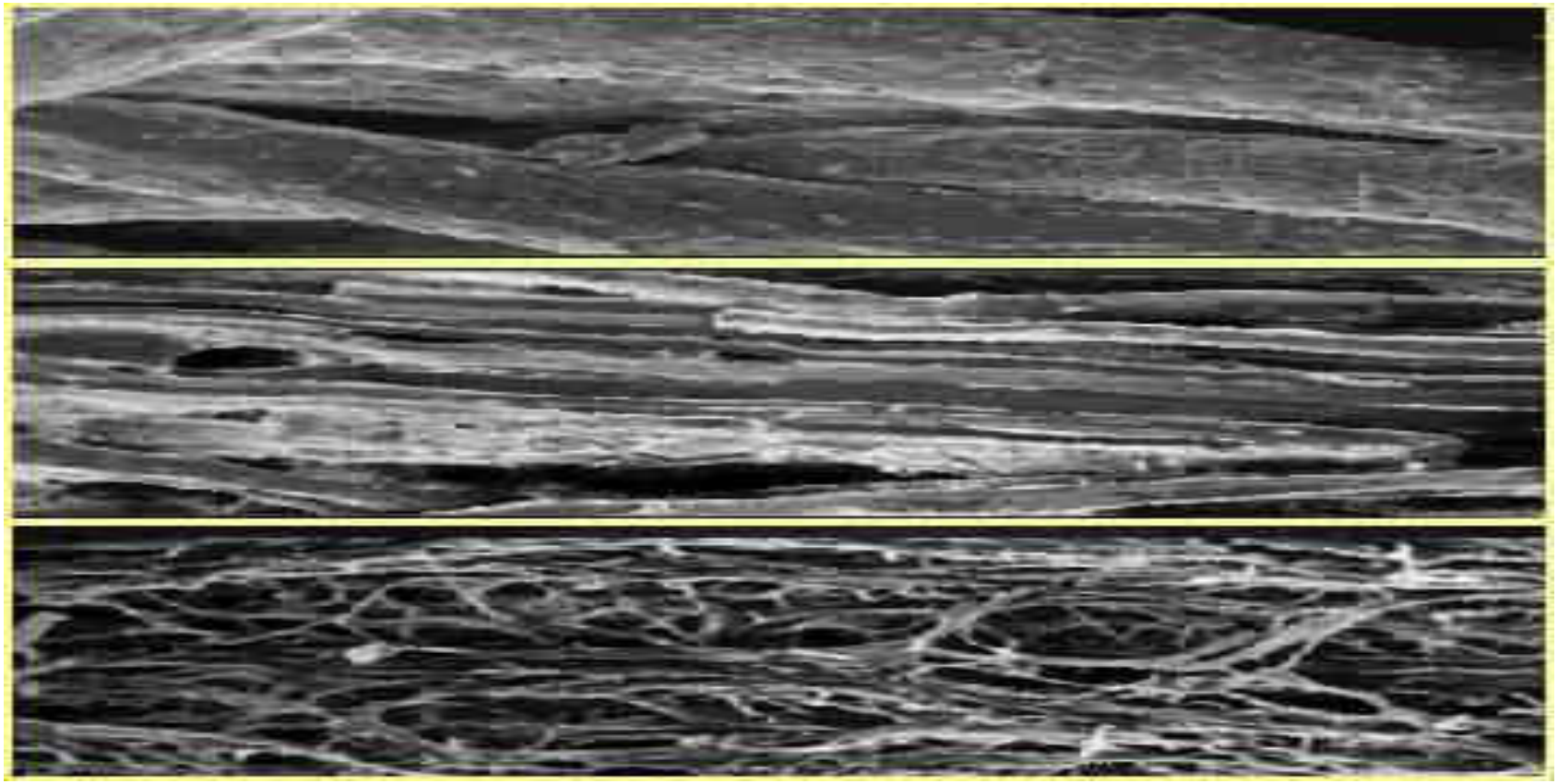


Quorn product range - overview of production



Unique attributes

No other protein can create the meat like textures achieved by Quorn



Key comparisons - Quorn

ENVIRONMENTAL COMPARISON PROTEINS AND MYCOPROTEIN

	GHG (kg/kg)	LAND (ha/te)	WATER (m3/te)
MYCOPROTEIN	1.6	0.17	860
	source#4: carbon trust lifecycle analysis of mycoprotein. Report 2014		
QUORN MINCE	2.4	0.4	1900
SOYABEAN	0.1 - 17.8	0.43	2500
	source#1	source#2	source#3
BEEF (GRAZED)	121 (114 - 130)	5	21500
BEEF (MIXED)	30 (16 - 69)	3.5	19500
	source#4: carbon trust lifecycle analysis of mycoprotein. Report 2014		
POULTRY	9	0.7	3970

Compared with Quorn mince ex factory

	GHG	LAND	WATER
Beef (mixed)	X12	X9	X10
Beef (grazed)	X50	X12	X11
Poultry	X4	X2	X2

working with the Carbon Trust

100g CO2

- By working closely with **Carbon Trust** we have established that Quorn foods offer **significant environmental benefits** relative to meat.
- Quorn is the **first and only** meat free brand to have carried out such a **systematic third party** analysis of its environmental footprint.

1 Geraldes, E & Freire F (2013) Greenhouse gas assessment of soyabean production: implications of land use change J Cleaner Production **54,** 49 -60

2. Matsuka, T& Goldsmith, P (2009) World soyabean production: Area yield and projections. In: J Food Agric Management review **12** (4) 143-161

3. Ercin, AE Aldaya, M &Hoekstra, AYl (2011) The water footprint of soymilk, soyburger and equivalent animal products. UNESCO IHE Inst Water Education. Report **49**

4. Carbon Trust. Report to Marlow Foods (2014) Available on request

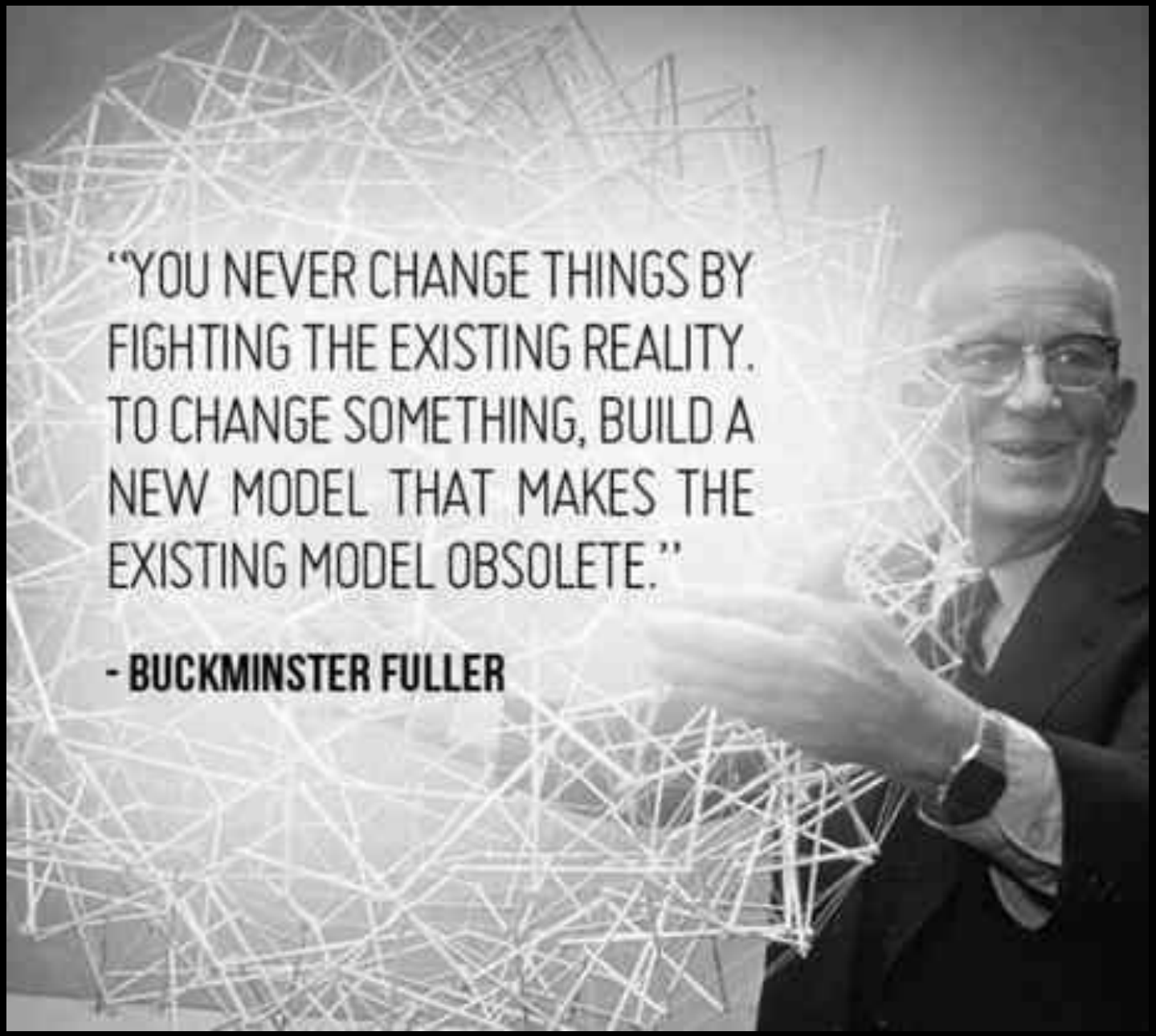
Quorn Foods achieved reductions in the product carbon footprints of all certified products with up to 15% footprint reductions

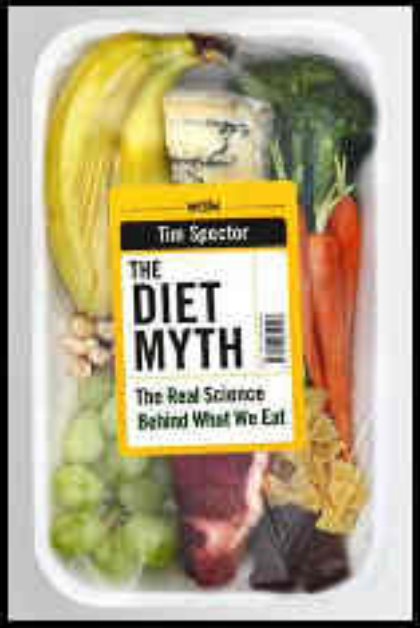
Who’s responsibility is it anyway ?

Fat profits: how the food industry cashed in on obesity

Ever since definitions of healthy bodyweight changed in the 1990s, the world has feared an obesity epidemic. But the food giants accused of making us fat are also profiting from the slimming industry

EU healthy eating funding discriminates against plant proteins: ENSA


"YOU NEVER CHANGE THINGS BY FIGHTING THE EXISTING REALITY. TO CHANGE SOMETHING, BUILD A NEW MODEL THAT MAKES THE EXISTING MODEL OBSOLETE."
- BUCKMINSTER FULLER



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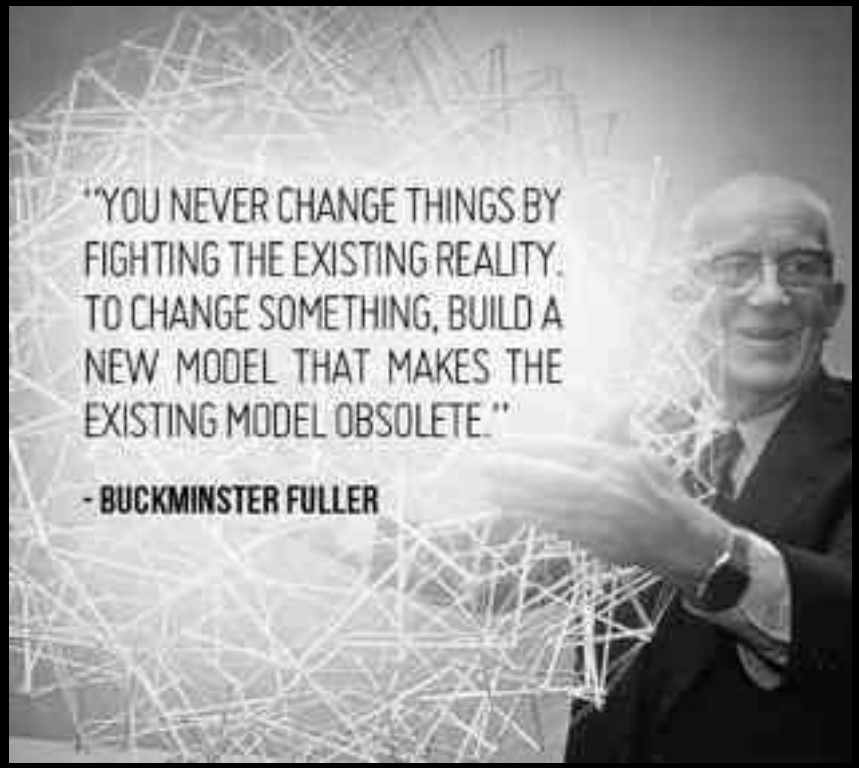

THANK YOU