



Quorn Foods

A Fifty Year Overnight Success Story

Steve Finn

Who is Steve Finn?



Married with four children, one Daughter-in-law, and one Grandson

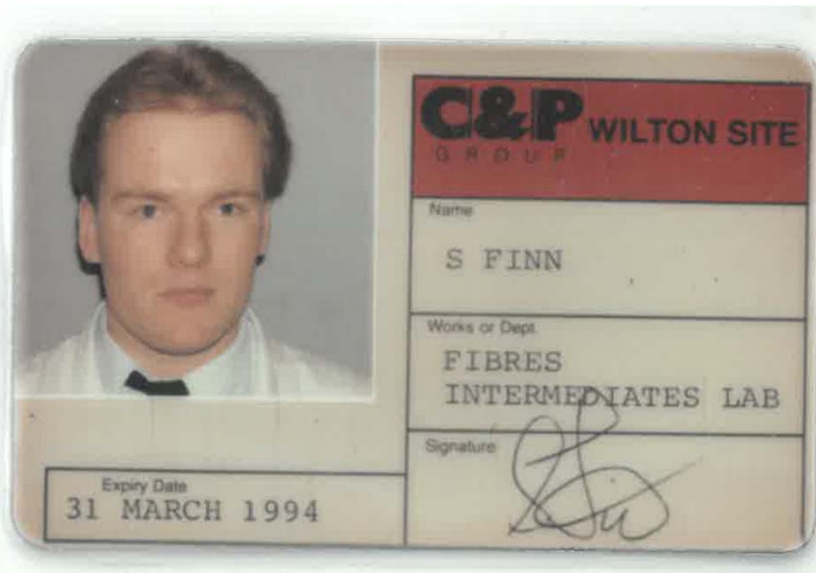


Leisure

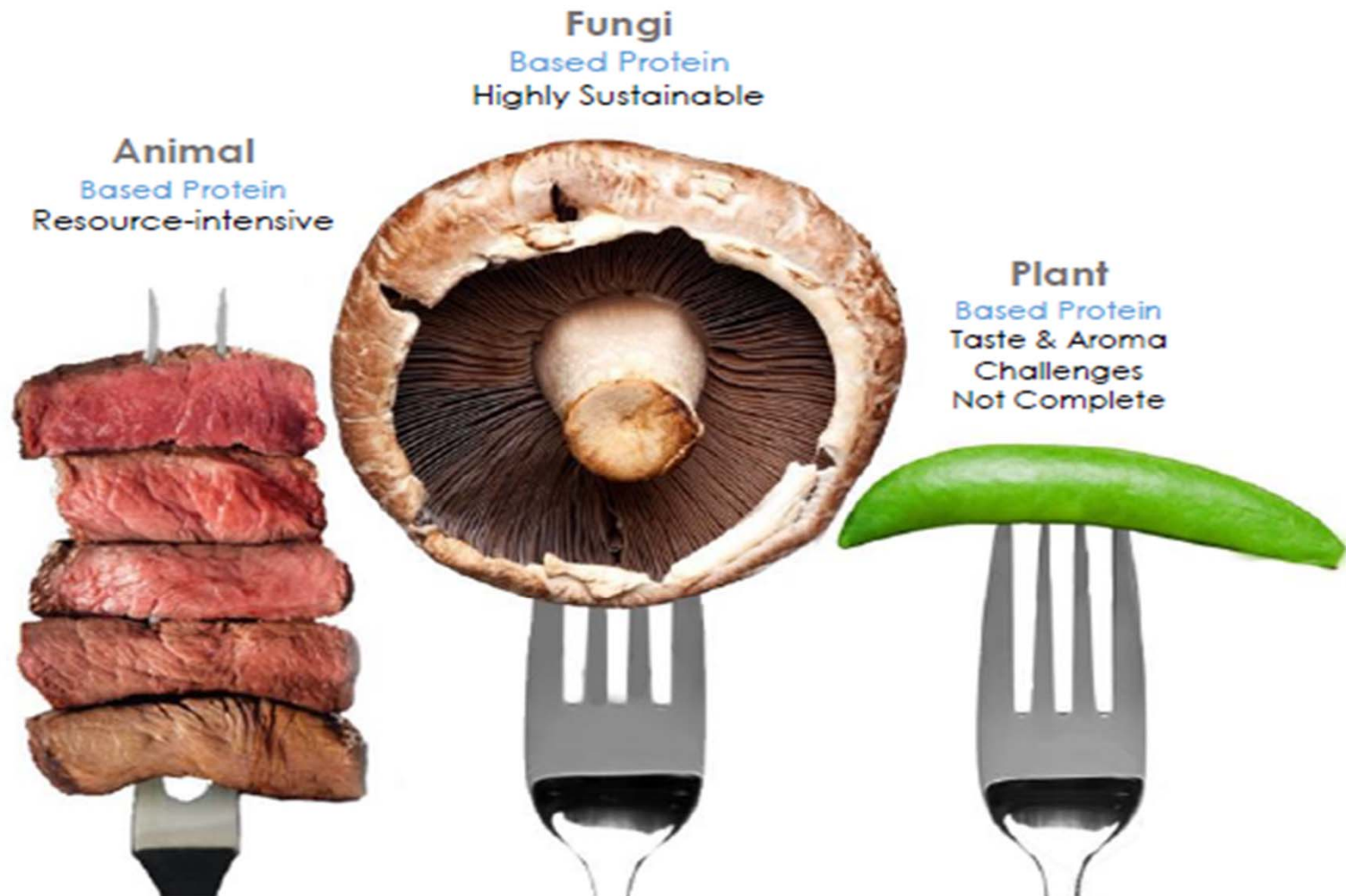


Work

- NHS – Biomedical Scientist
- ICI – Analytical Chemist
- ICI - Process Technologist/Microbiologist
- ICI/Quorn – Shift Manager
- AZ/Quorn – Operations Manager
- Quorn – General Manager



How Did Quorn Begin?



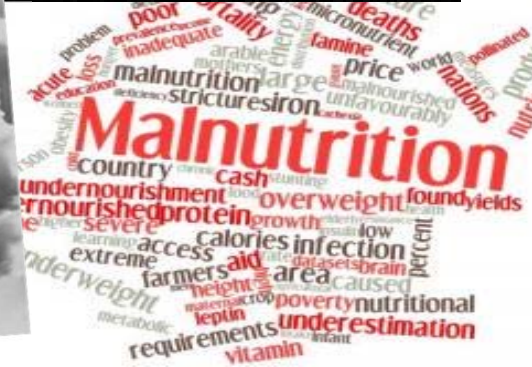
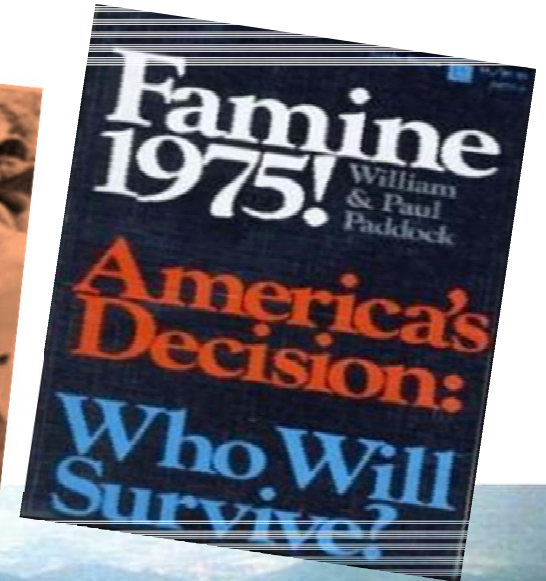
Once Upon a Time, 50 years ago



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



....And growing concerns



Quorn story



A man with a big idea



Brief History of Quorn

- Early 1960s experts predicted worldwide protein famine by 1980s
- Lord Rank started the 'Starch to Protein' project
- Search began in 1967 – requirements were delicious, nutritious and safe to eat food
- >3000 soil samples from all over the world were screened
- *Fusarium venenatum* A3/5 was eventually found in a garden in Marlow, Buckinghamshire
- 20 year research/scale-up programme
- JV with ICI in 1984
- Approved by MAFF in 1985 as the 'first new food since the potato'
- Marlow Foods formed in 1986 and first product on sale 1987 after RHM/ICI joint venture





Monde Nissin



Why Billingham?



'Belasis Site' 35 years ago

'Food from Fuel'

Belasis Site was first developed by ICI in the early 1980's to make an animal feed single-cell protein -

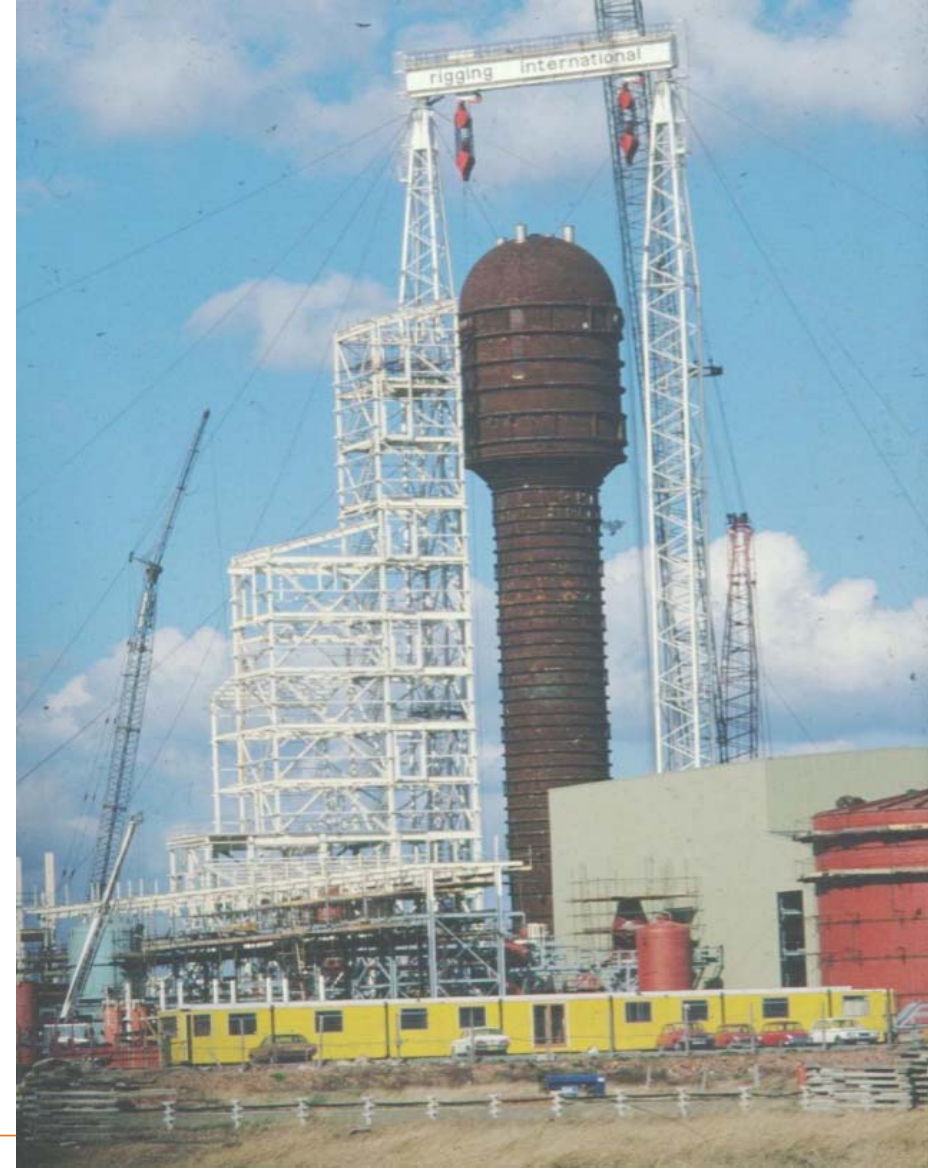
called **Pruteen**



ICI 'Pruteen'



ICI's unique single cell protein process





Technical
Success



However,
Commercial
Failure






The time for Mycoprotein
is now!



The current context...



		
Chickens	110,000	
Pigs	2,630	
Sheep	922	
Goats	781	
Cows	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

Challenges for a scalable, meat-based sustainable, food future



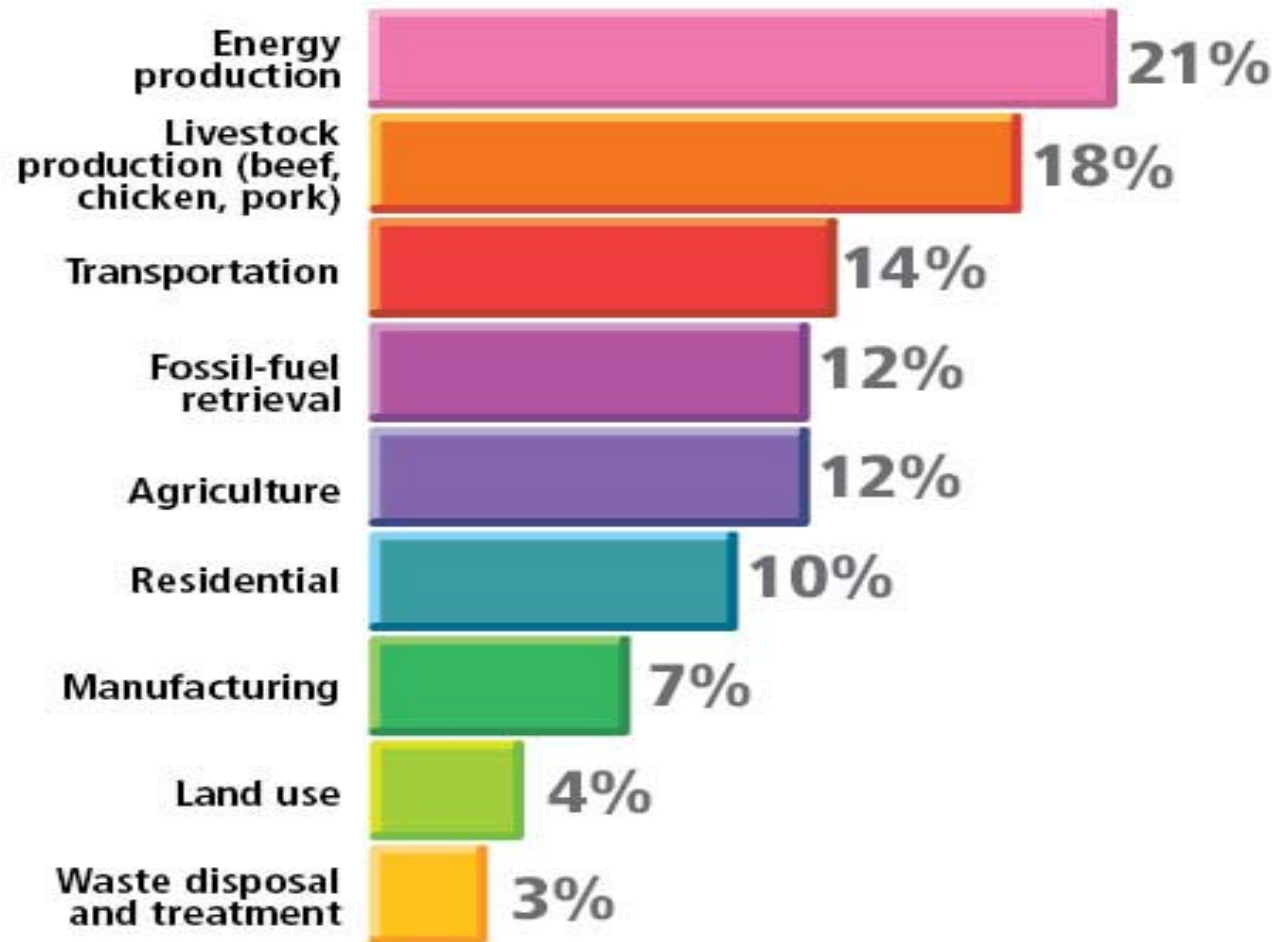
Challenge	Consequence
To feed 9bn in 2050 FAO say we need	70% more food available



some of the true costs of cheap and plentiful animal protein



Global Greenhouse Gas Producers



Total is greater than 100% because of rounding





Mishka Henner



Quorn Environmental Footprint



Key Comparisons vs Quorn

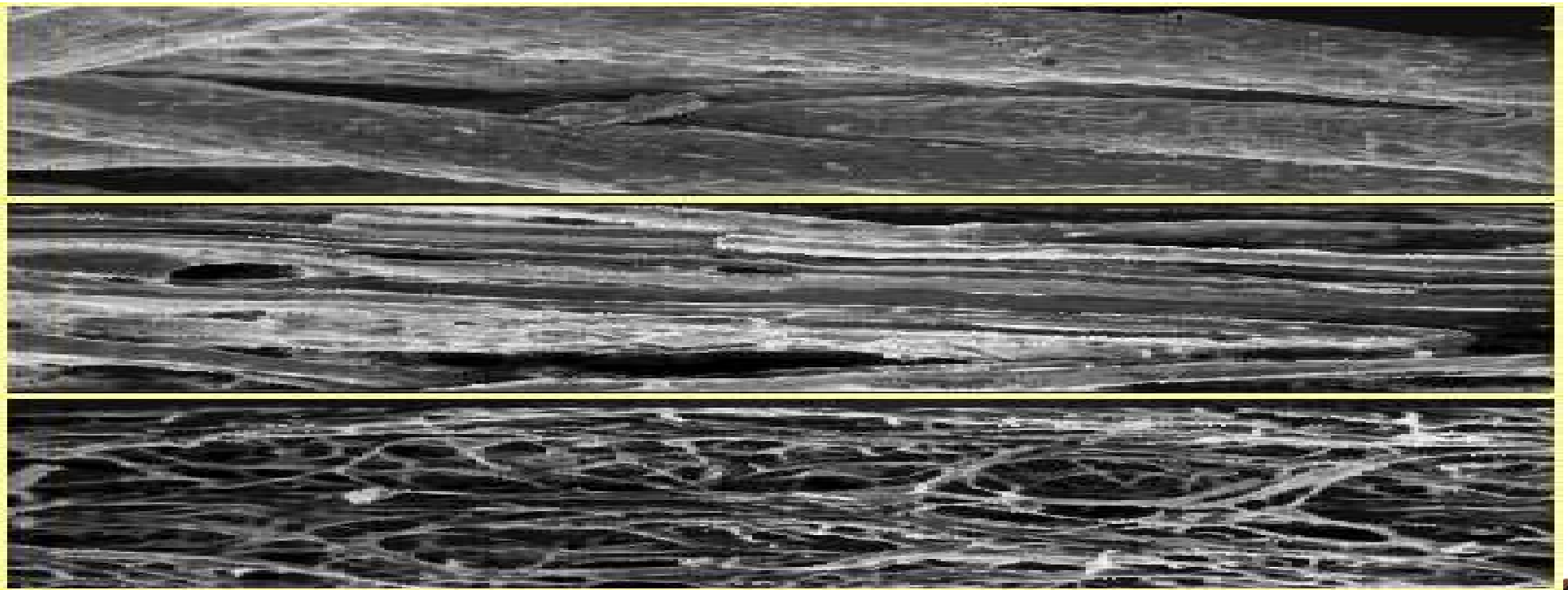
	GHG	LAND	WATER
Beef Mixed	x9 more GHG	x9 more land	x10more water
Beef Grazed	x36 more GHG	x12 more land	x11 more water
Chicken	x3 more GHG	x2 more land	x2 more water



Unique textural attributes



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

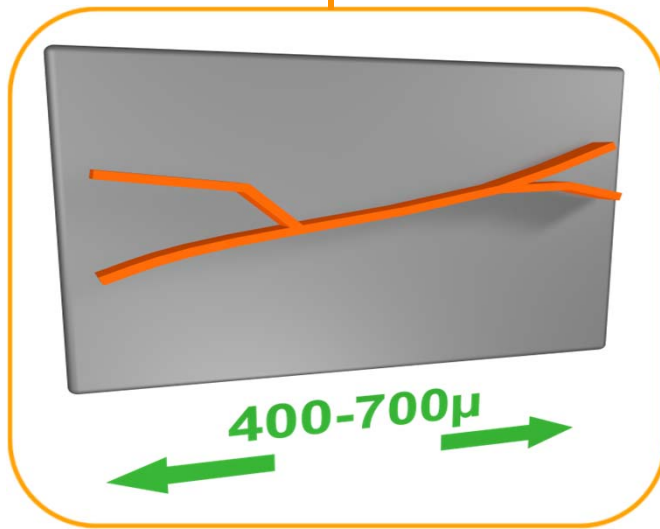


Mycoprotein: protein and fibre



BENEFITS

Physical Properties (shape)



Texture creation

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

Composition

General Nutrition

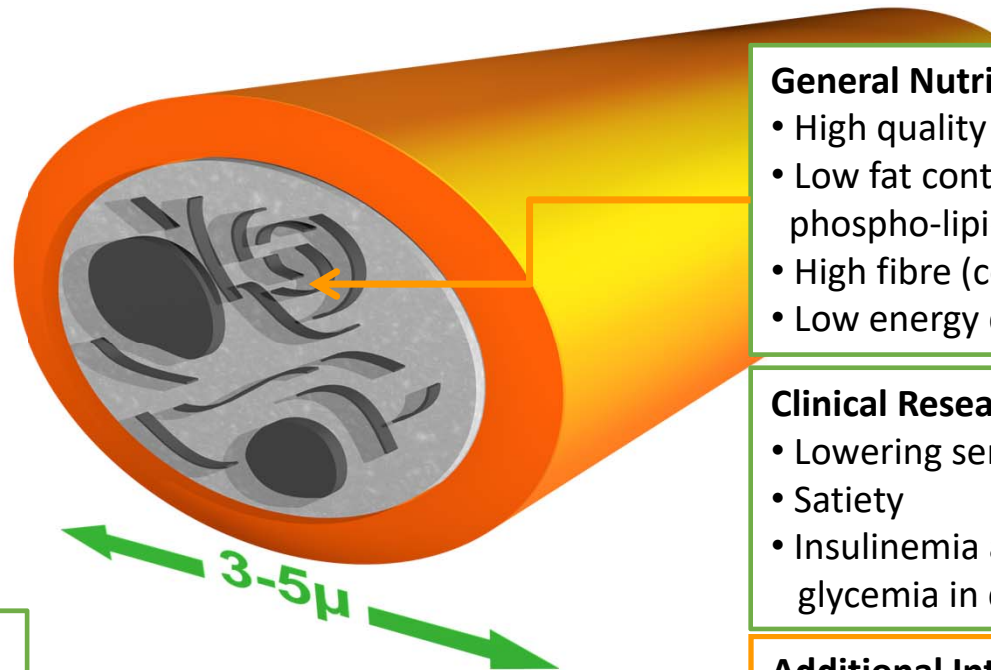
- High quality protein
- Low fat content (membrane phospho-lipids)
- High fibre (cell wall)
- Low energy density

Clinical Research Programmes

- Lowering serum cholesterol
- Satiety
- Insulinemia and glycemia in diabetics

Additional Interest

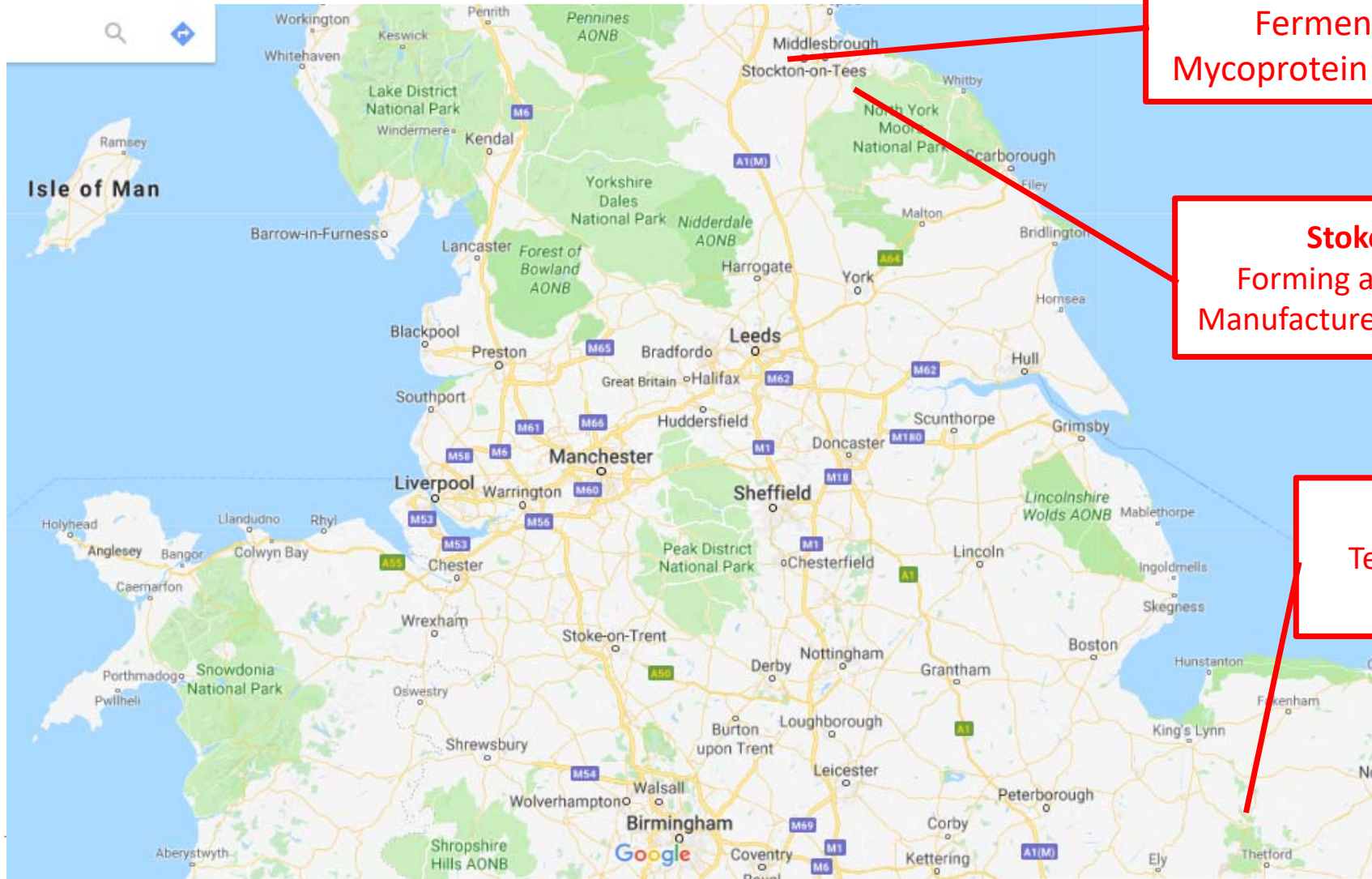
SCFA production
Fibre (chitin and β -glucans)



Quorn fits easily into everyday life and makes meat reduction simple...



Quorn Foods UK Supply Chain



Billingham
Fermentation
Mycoprotein Production

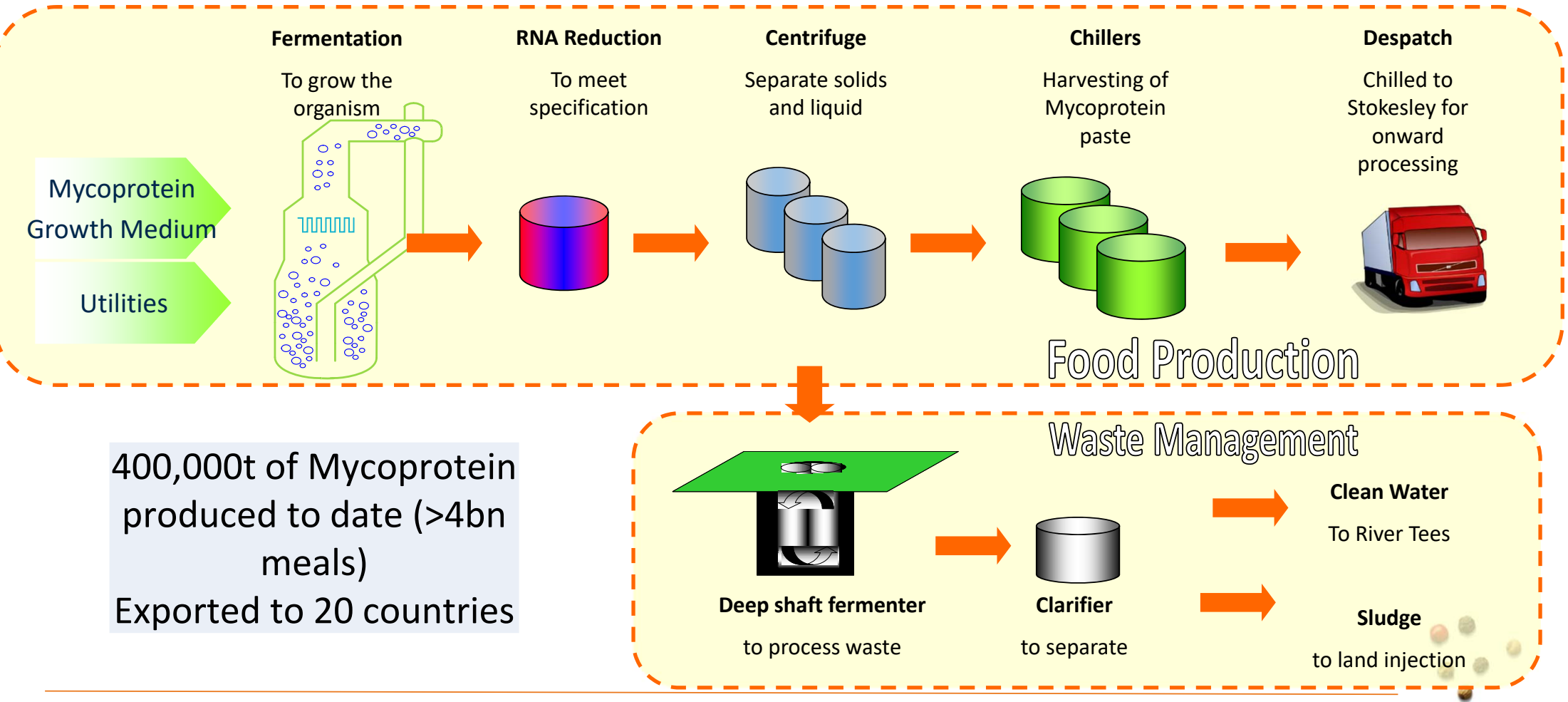
Stokesley
Forming and Frozen
Manufacture and Packing

Methwold
Tertiary Manufacture
Chilled Packing

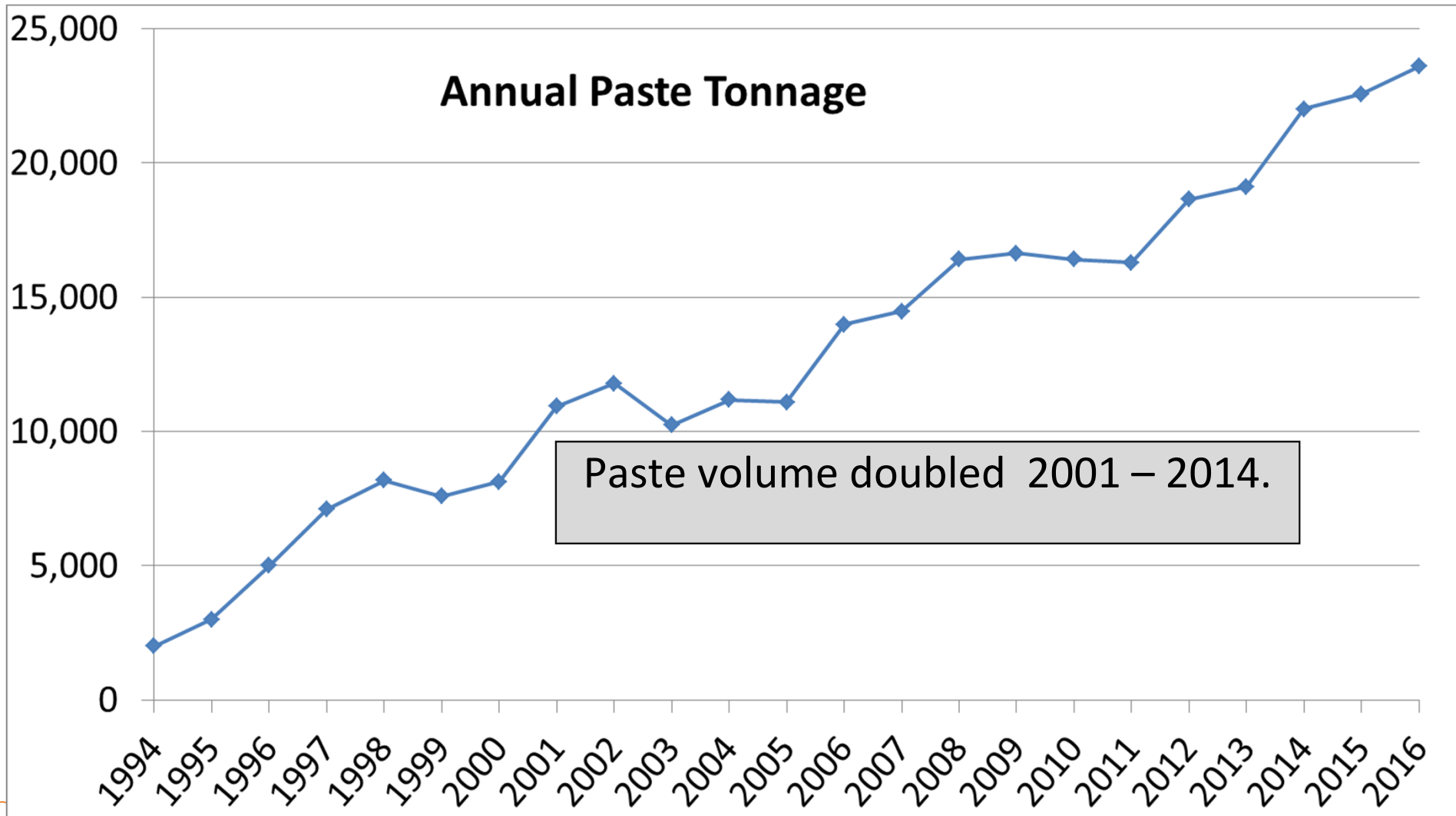


Billingham Process

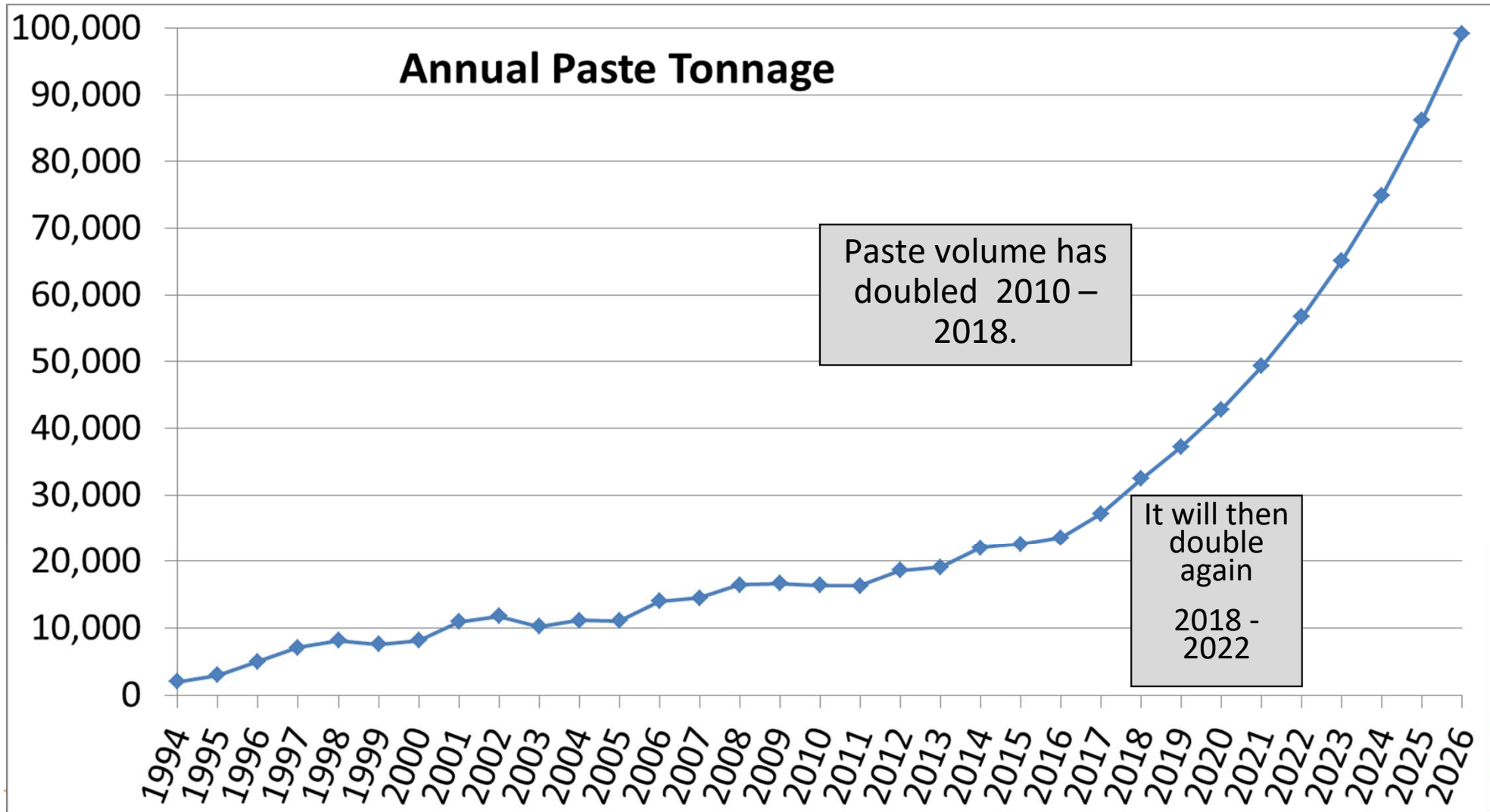
Efficiently Converts Glucose to Protein



Paste Volume Growth 1994 - 2016



Paste Volume Growth Projected to 2026



Building a 'Billion Dollar' Business by 2027



Gillette

Orbit



McCain





Existing 3 x Fermenters

1994, 1996, 2015
480,000 litres total
capacity

R&D Pilot Plant

Jan 2019

BF2 Harvesting/Forming

Oct 2021

Fillets, Nuggets Goujons etc

BF1 Harvesting/Forming

**Combined Investment >£120m
Generating ~100 new Jobs**

**Wastewater
Treatment**
Aug 2018

BQ6 Fermenter

Jan 2022

170,000 litres

Global Centre of Excellence for Fermentation science

- Pilot plant under construction
 - Cost estimate- £2M
 - Build start – Q2 2018
 - Commissioning – Q1 2019
 - Capacity ~200 litres
 - New science based employment on site for graduate level scientists
 - Next generation IP development
- Development facility to optimise production
- Biotech centre for strain improvement
- Process Design centre for next generation fermentation
 - collaboration with CPI Wilton

CATAPULT
High Value Manufacturing



Easy Way to Remember:

The Eight F's

Member of the **FUNGI** family

That's grown by **FERMENTATION**

And is **FILAMENTOUS**

That helps us to create **FIBROSITY**

Which we achieve through **FREEZING**

And creates nutritious new **FOOD**

With a low environmental **FOOTPRINT**

Part of a Sustainable **Food Future**





THANK YOU

