



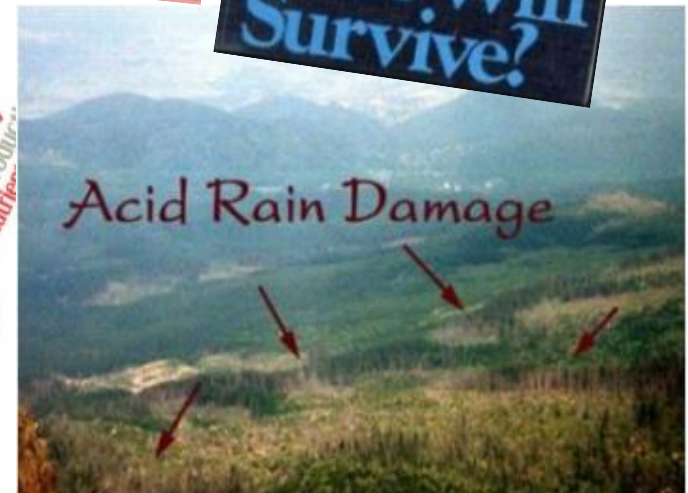
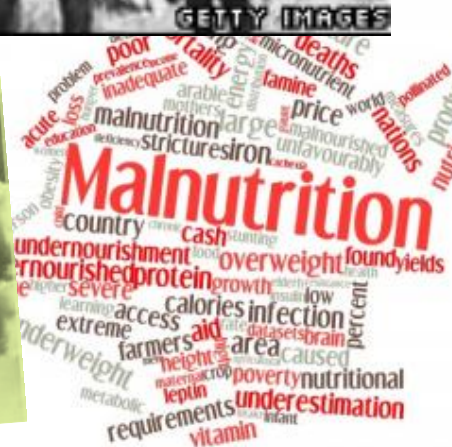
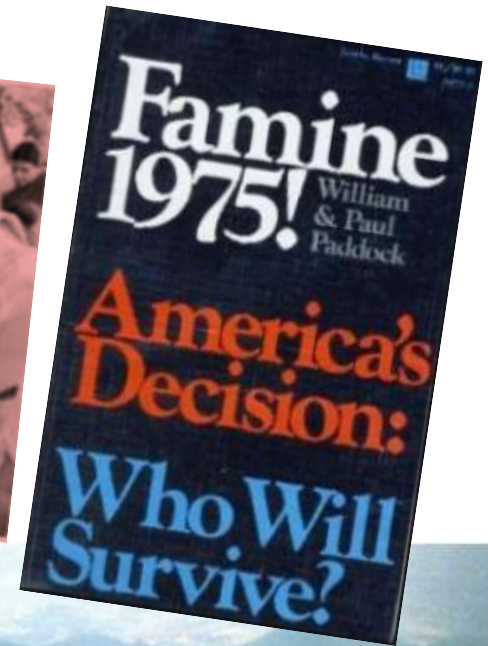
From plants to products – The Quorn story



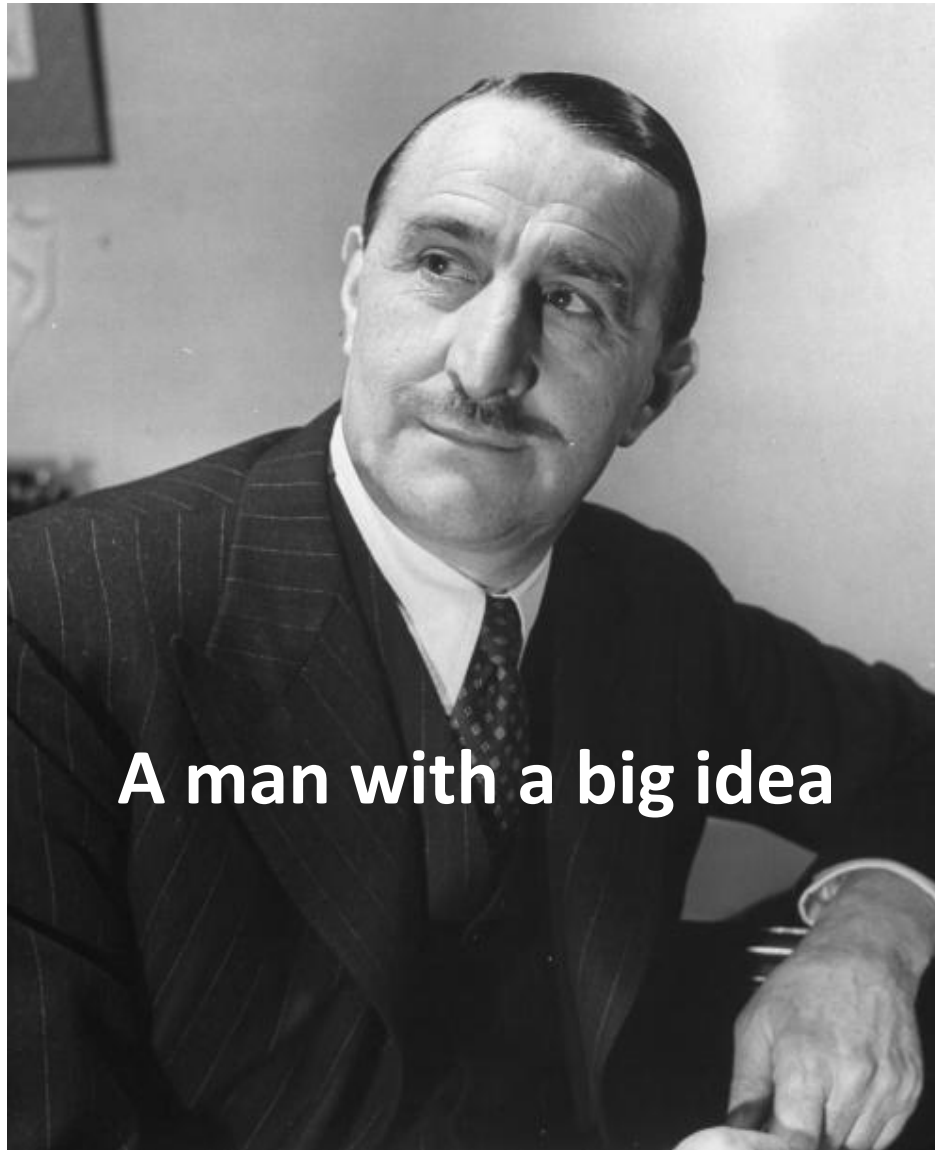
The 1960s was a time of huge achievements...



....And growing concerns




Quorn is born



A man with a big idea

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

Dramatic changes are shaping the future of food policy



Challenges for a scalable meat based sustainable food future

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



[http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How to Feed the World in 2050.pdf](http://www.fao.org/fileadmin/templates/wsfs/docs/expert_paper/How_to_Feed_the_World_in_2050.pdf)

<http://www.tristramstuart.co.uk/FoodWasteFacts.html>

<http://ecowatch.com/2014/04/11/agricultures-greenhouse-gas-emissions-2050/>

Quorn offers important benefits in everyday foods



And because of mycoprotein delivers against the four mega-trends



Meat reduction and vegetarianism

Quorn provides the protein lost from not eating meat.
Superior in taste and texture to alternatives.
Superior in taste and texture to alternatives.
Safe and non allergenic¹

Heart Disease and diet

Quorn (mycoprotein) is Cholesterol free and lower in sat fat than the meat equivalent.
Initial studies show evidence of Cholesterol reduction²



Environmental impact³

Quorn mince is lower in embedded greenhouse gas than beef, chicken or lamb.
Lower pressure on scarce land resources.
Converting starch into protein(mycoprotein) is environmentally more benign than livestock.



Obesity and health

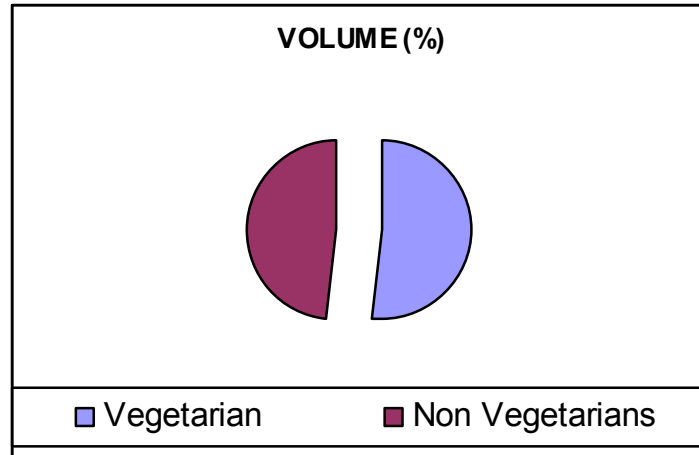
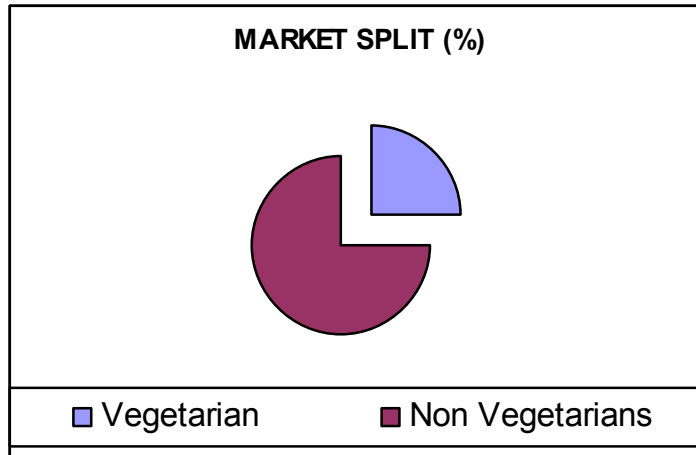
Lower in fat so lower in calories v meat.
High in protein and fibre so satiating/satisfying.
Initial studies show potential for weight reduction claim.

1. Expert Panel. March 2011
2. EFSA ruling mycoprotein and beta-glucan April 2011
3. Finnigan TJA (2010) Mycoprotein LCA and the Food 2030 challenge. Aspects Biol. 102, 81 -90



**VEGETARIANISM, MAINSTREAM
&
CONSUMER ISSUES**

Vegetarians vs. Non Vegetarians - The Marketplace Dynamics



BOTH GROUPS ARE IMPORTANT TO THE QUORN BRAND

Quorn UK consumer profile



	Vegetarian	Health & weight managers
% UK households	9%	58%
% of Quorn sales	63%	37%
Meat free category penetration	83%	30%
Quorn brand penetration	65%	26%
Purchase frequency	Every 2.5 weeks	Every 11 weeks
Annual spend on Quorn	£60.35	£12.20



- Proven history of expanding vegetarian frequency
- Proven ability to grow non vegetarian penetration with considerable head room

Natural appeal



At the heart of all Quorn foods is

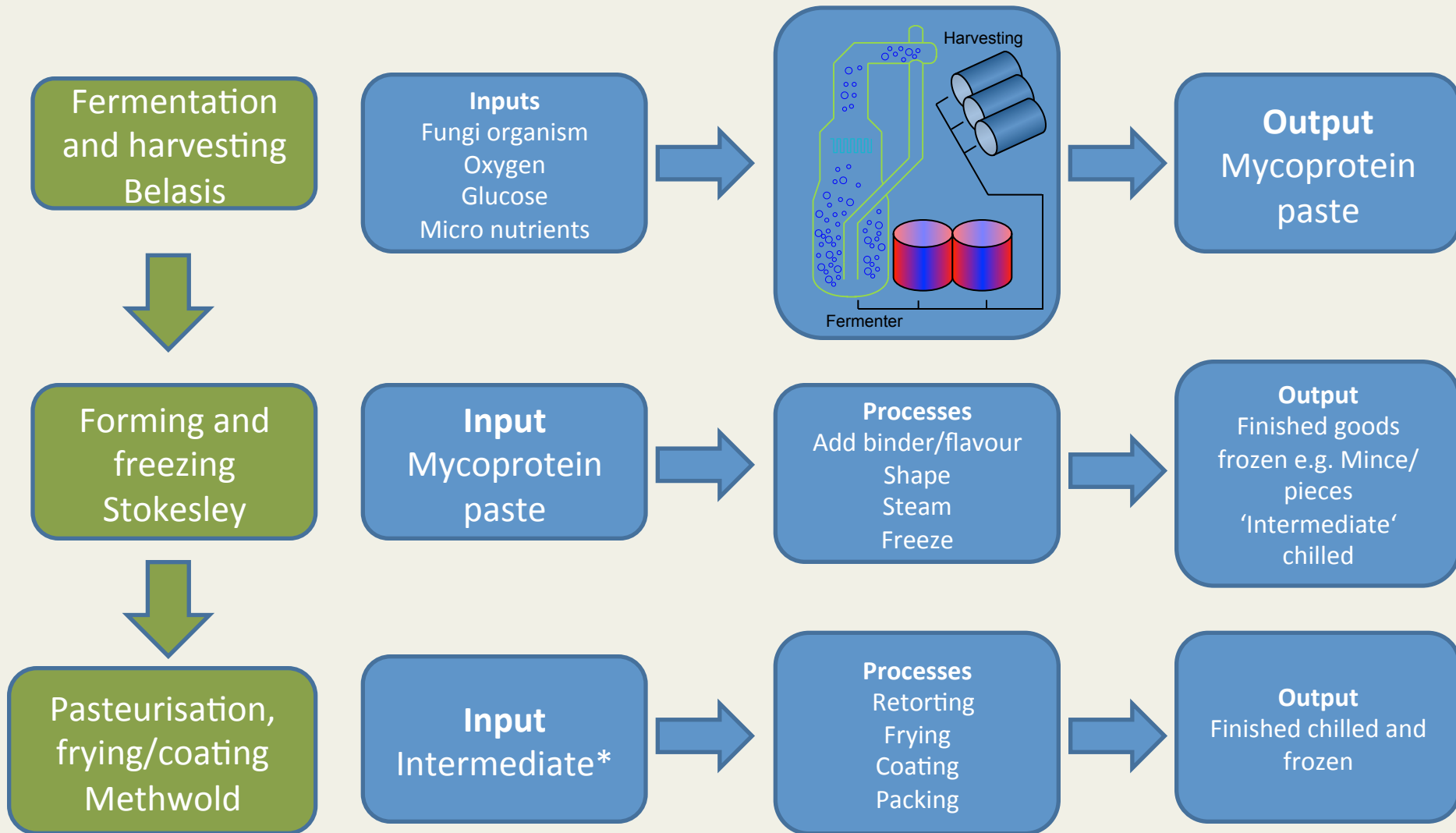
mycoprotein...

..Our 50 year 'overnight success'



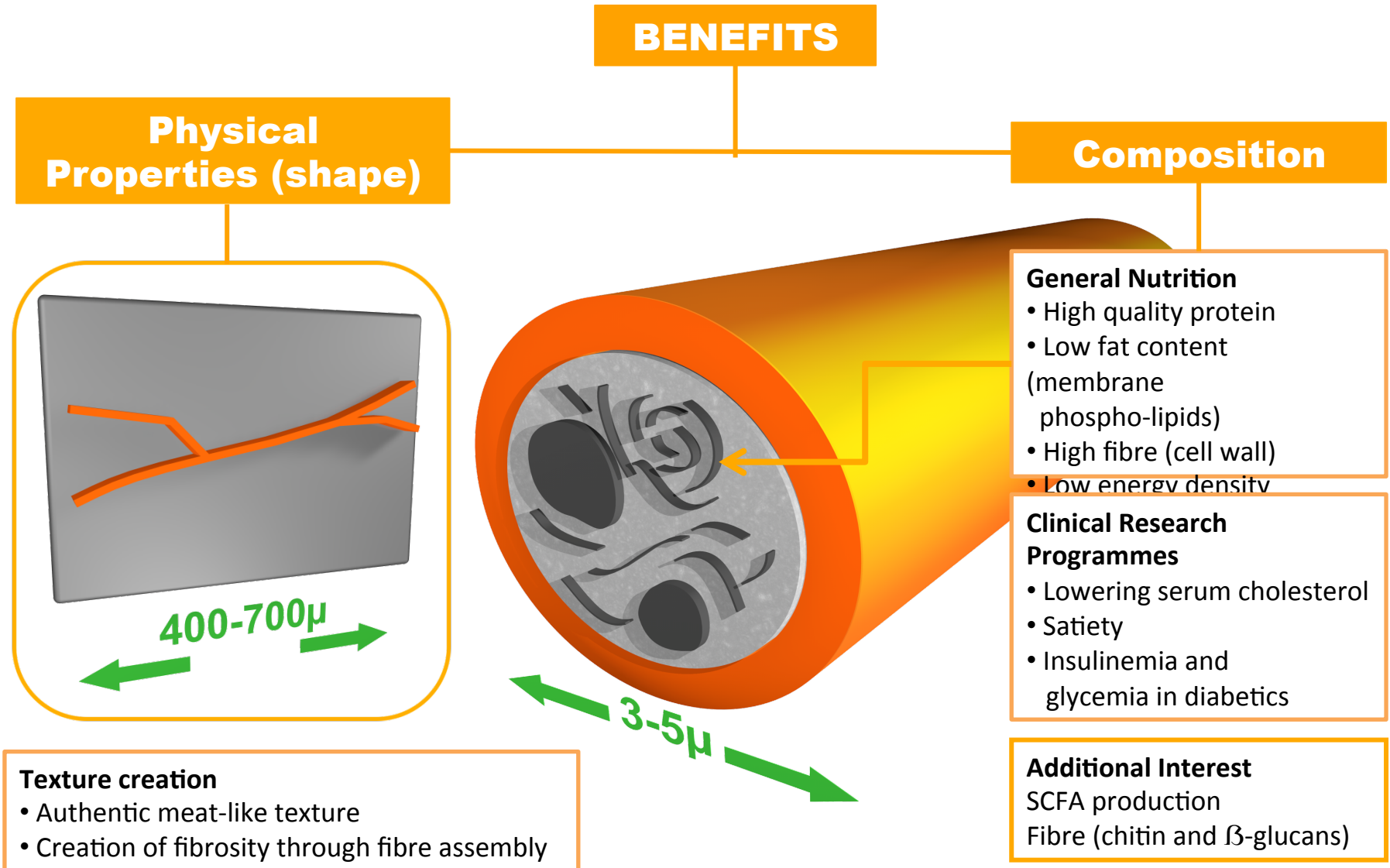
So, what is it?

Quorn manufacturing process

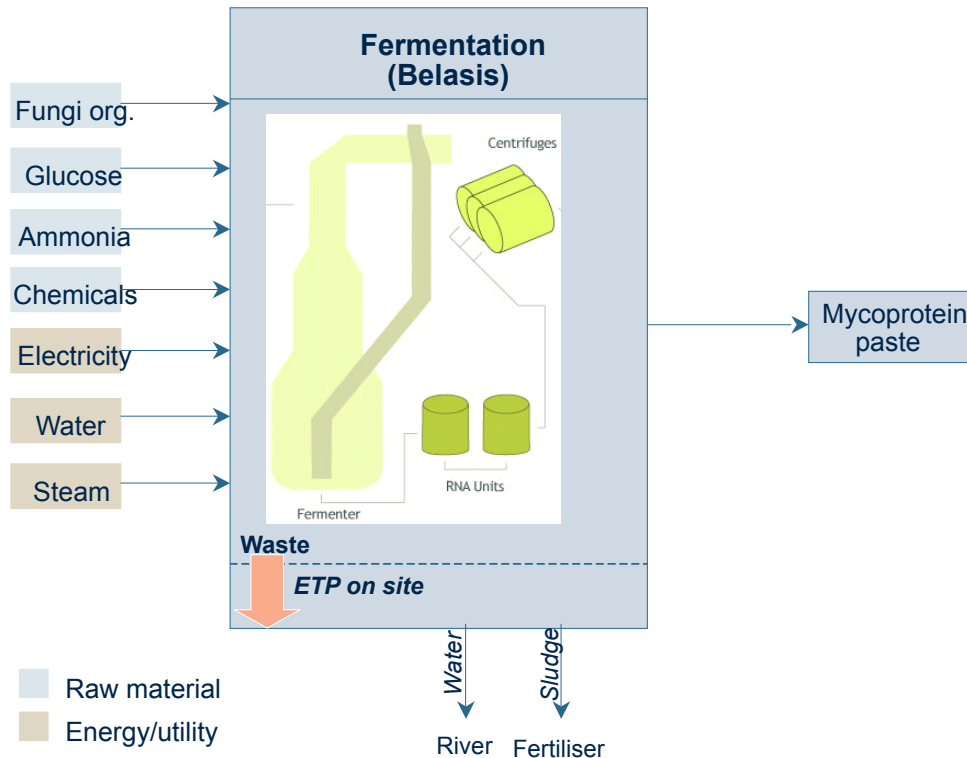


* Intermediate can be formed product for frying/coating or finished product (e.g. Sausage) for pasteurisation (retorting) and packing

Mycoprotein– key ingredient in Quorn products

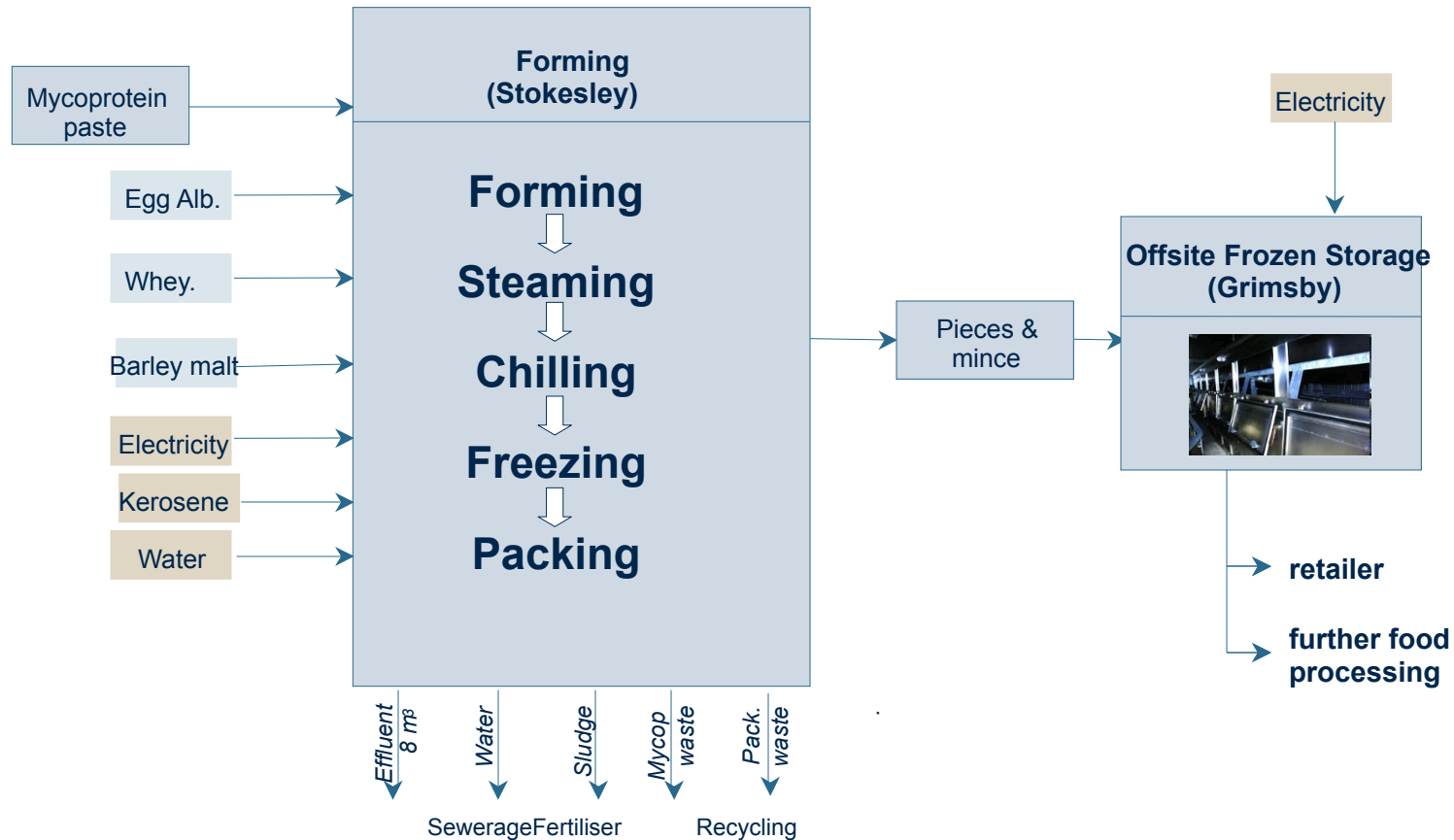


Mycoprotein is grown through controlled fermentation



Converts starch to protein efficiently
Main raw materials are glucose, electricity and egg albumen

Quorn products are manufactured similar to other foods using mycoprotein



Main raw materials are egg albumen, whey protein & flavour

Quorn is superior to soya/wheat based competitors



Quorn and soy under microscope

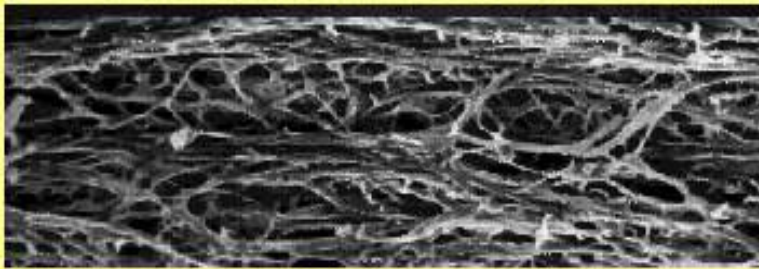
Soy



Chicken



Mycoprotein






Why Quorn is superior

- Quorn superior on replicating texture – delivers fibrosity
- Quorn superior on taste
 - no aftertaste
 - absorbs flavour
- Quorn is a non allergen
 - soya and wheat are both allergens

Quorn is preferred by consumers



Consumers recognise product superiority to leading competitors

Country & Product		Brand	Purchase Intent
	UK Mince	Quorn	75%
		Linda McCartney	42%
	US Chicken Nuggets	Quorn	86%
		Morningstar	58%
	Australia Sausages	Quorn	70%
		Fry's	30%

Meals are healthier with Quorn



Switching from using beef mince to Quorn mince in a Spaghetti Bolognese once a week is equivalent to running 4 marathons a year*



	Spaghetti Bolognese	
	Meat	Quorn
Calories	516	314
Fat %	26.6	8.6
Saturated Fat %	10.1	1.4



Excellent sustainable credentials



Estimates that livestock (meat production) makes up 18% of Greenhouse gas emissions

- Livestock represent 18%+ of greenhouse gases issue*
 - Quorn environmental footprint – 90% lower than beef
- Land and Water are becoming in short supply
 - Quorn uses 90% less land and water than beef
- Livestock is inefficient at producing protein
 - Beef converts grains – protein at 10 – 1 ratio
 - Quorn converts at 2 – 1 ratio (wheat– protein)



Quorn Foods is the first global meat-alternative brand to achieve third-party certification of its carbon footprint figures

Comparative carbon emissions



* UN report 'Livestock's Long Shadow' 2006

Ingredients in Quorn



Dried egg white

214 million eggs in 2014

Challenges

- **Cost**
- **Availability (e.g. avian flu)**
- **Reduce protein from animal source**



Dried whey protein

214 million litres of milk in 2014

Challenges

- **Cost**
- **Availability (e.g. foot & mouth)**
- **Reduce protein from animal source**

Ingredients in Quorn



Glucose syrup from wheat

60 million kg of wheat in 2014

Challenges

- **Cost**
- **Availability (e.g. competition)**
- **Evaluate other sources of fermentable CHOs**



Range of flavours and seasonings

665,000 kg in 2014

Challenges

- **Relatively high dosage**
- **Severe process (losses)**
- **Retain healthiness – low salt, natural, etc.**

Quorn is market leader in 9 of the 14 international markets where the business is present and is the most international of all the competitors

Brand	Ingredient	Countries Present
Quorn	Mycoprotein	UK(#1), USA (#3), Australia(#1)Belgium(#1), Luxembourg (#1), Holland(#3), Switzerland(#1), Ireland(#1), Sweden(#2), Denmark(#1), Norway(#1), Australia(#1), Finland(#2) Germany(new), New Zealand(new), South Africa (new)
Fry's (Family)	Soya and Wheat	South Africa, Australia, India
Tivall (OCEM/Nestle)	Soya and Wheat	Israel, Netherlands, Sweden, Belgium
Boca (Kraft)	Soya	USA
Linda McCartney (Hain Celestial)	Wheat and Soya	UK, Australia
Alpro (Dean Foods)	Soya	Belgium, Netherlands
SojaSun (Family)	Soya	France, Italy, Portugal, Spain
Vegetalex (Family)	Soya	Argentina, Chile
MorningStar (Kellogg's)	Soya and Wheat	USA
Valess (Friesland)	Soya	Germany, Sweden, Netherlands
Lite Life (Conagra)	Soya and Wheat	USA

Future Food - playing a leading role



How can diets rich in mycoprotein contribute to health and wellness?

What is the impact of our food and of our organisation on the environment and how do we compare?

How do we create flavours and texture in Quorn products that make it irresistible?

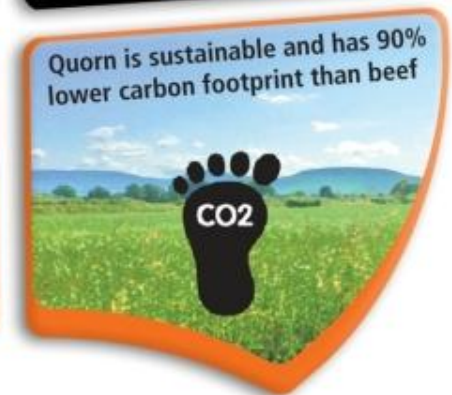
How can we collaborate to address these key issues and contribute to the debate?

• In summary

Quorn

Foods

Quorn



• Thank you!

