



The UK animal feed sector – innovation, sustainability and Net Zero

Hybrid meeting - Wednesday 22 March, 5.15 – 6.30pm
Meeting Room M, Portcullis House

Agenda

- 1. Chairman's welcome & introduction – Julian Sturdy MP**
- 2. Guest speakers:**
 - James McCulloch, Head of Animal Feed, Agricultural Industries Confederation (AIC)
 - Nick Major, Corporate Affairs Director, ForFarmers
 - Keiran Whitaker, Founder, Entocycle
 - John Knight, Technical Director, SugaRich
- 3. Questions & discussion**
- 4. A.O.B.**

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agricultural
industries
confederation

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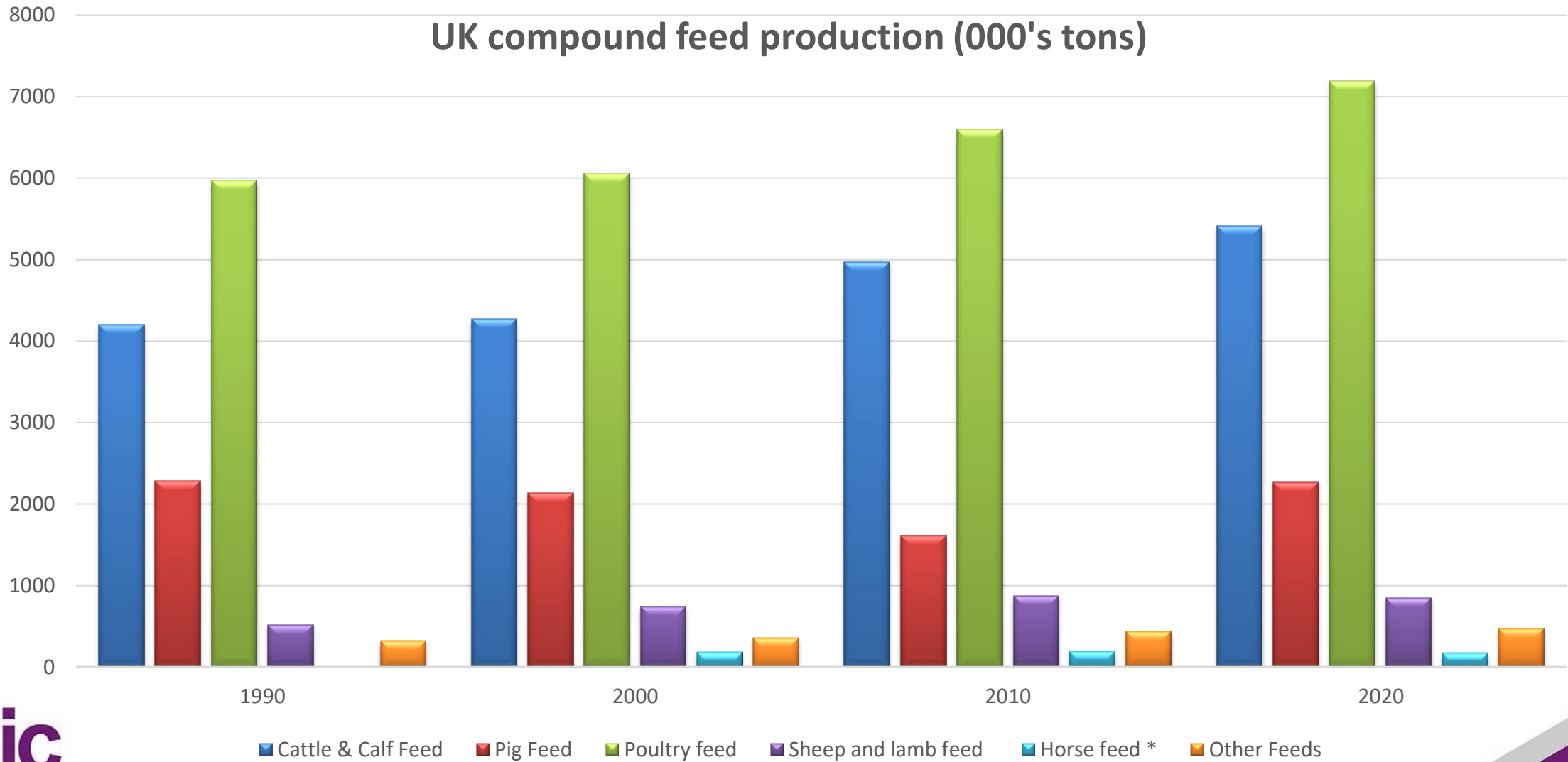
All-Party Parliamentary Group on
Science and Technology in Agriculture

**The UK animal feed sector –
innovation, sustainability and Net Zero**

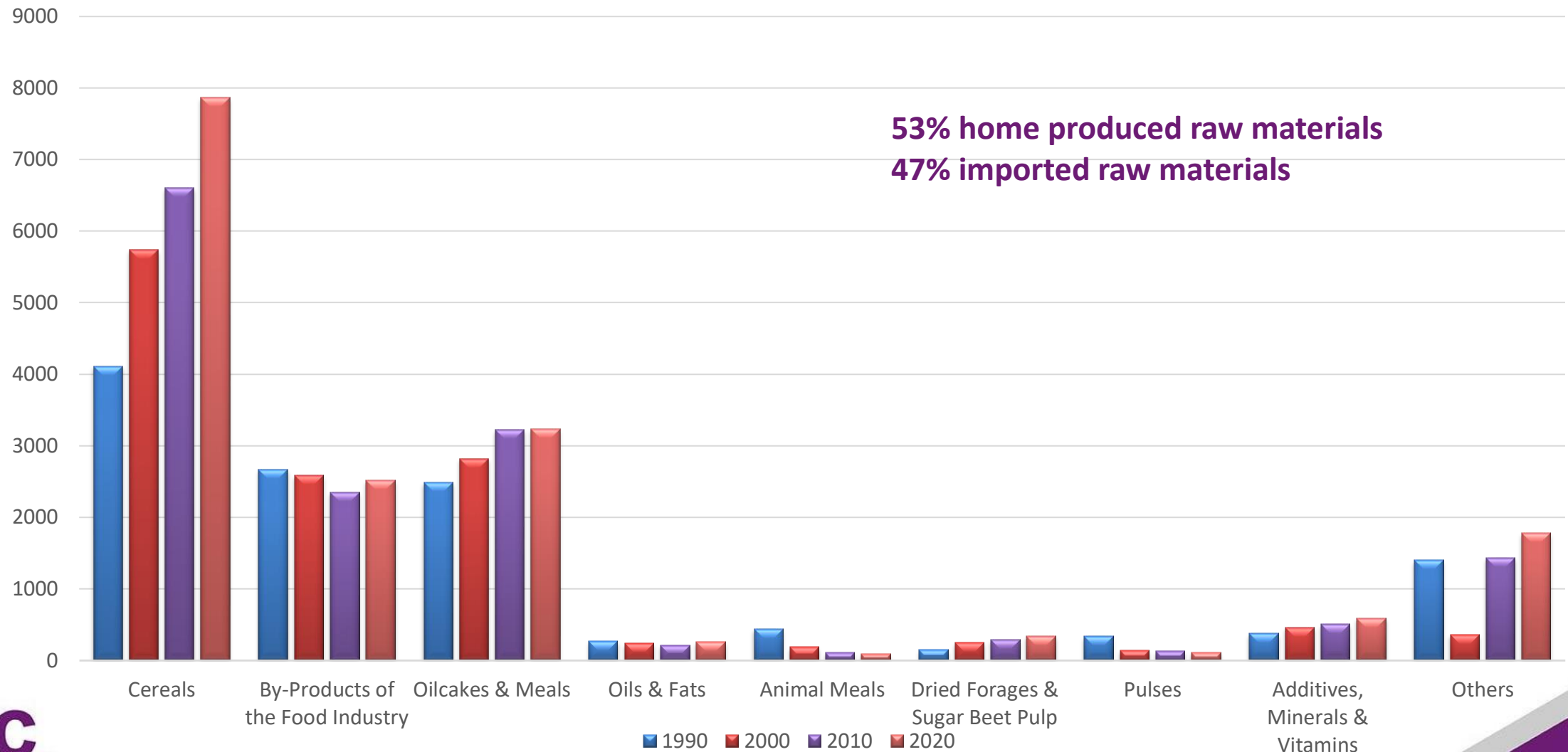
The AIC Sectors



UK Animal Feed Industry - production



UK Animal Feed Industry - raw material usage



Livestock production and feed footprint

Pork sector emissions

(carbon and land use footprints for UK pig production reported as Kg CO₂ eq/kg LW)

| | Indoor | Outdoor |
|---------------------------------------|------------|------------|
| Feed ^a | 2.1 | 2.1 |
| Manure management and enteric methane | 0.1 | 0.1 |
| Electricity | 0.1 | 0.3 |
| Total | 2.4 | 2.5 |

85%

Poultry (meat) emissions

(carbon and land use footprints for UK poultry meat production reported as Kg CO₂ eq/1000kg edible meat)

| Material or activity | Standard | Free range | Organic |
|----------------------|--------------|--------------|--------------|
| Feed and water | 3,140 | 3,690 | 4,080 |
| Electricity | 160 | 150 | 170 |
| Gas and oil | 430 | 340 | 310 |
| Housing and land | 530 | 780 | 1,030 |
| Manure and bedding | 140 | 160 | 80 |
| Total | 4,410 | 5,130 | 5,660 |

72%

Poultry (eggs) emissions

(carbon and land use footprints for UK egg production reported as Kg CO₂ eq/tonne eggs)

| Material or activity | Cage* | Barn | Free range | Organic |
|----------------------|--------------|--------------|--------------|--------------|
| Feed and water | 2,100 | 2,220 | 2,360 | 2,410 |
| Electricity | 240 | 480 | 200 | 240 |
| Gas and oil | 90 | 140 | 180 | 180 |
| Housing and land | 380 | 480 | 500 | 540 |
| Manure and bedding | 110 | 130 | 140 | 60 |
| Total | 2,920 | 3,450 | 3,380 | 3,430 |

72%

Where will innovation come from?

Responsible sourcing of 'Forest Commodities' such as soyabean meal, palm oil and their derivatives.

The use of Co-Products from food and biofuel industry processing.

The use of Former Food products.

The use of additives such as amino acids, enzymes and methane inhibitors.

The future role of 'novel' protein streams from carbon capture, algae, insects etc.

The use of GFLI LCA database to measure these impacts and to pass on this information to farmers

Looking further ahead

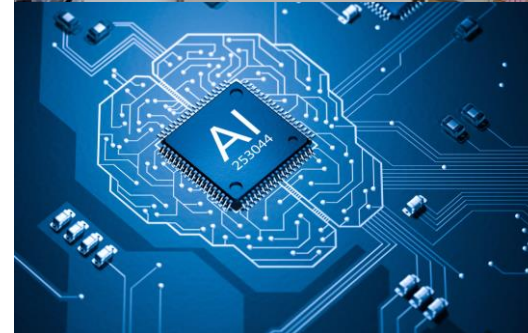
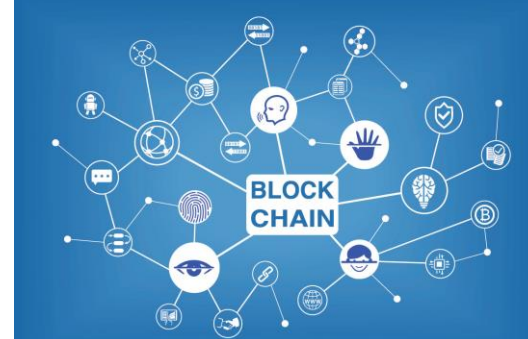
Green energy and feed production

Blockchain

Robotics

AI

EV feed distribution



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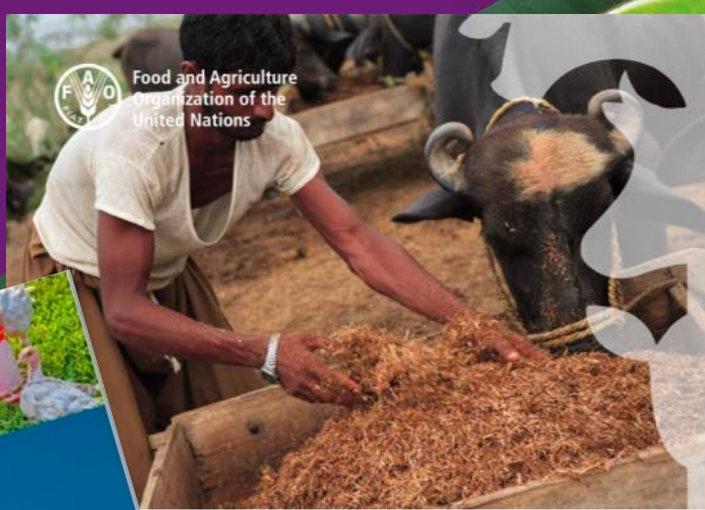
®



Thank You

**James McCulloch
Head of Feed
Sector, AIC**

Livestock solutions for climate change



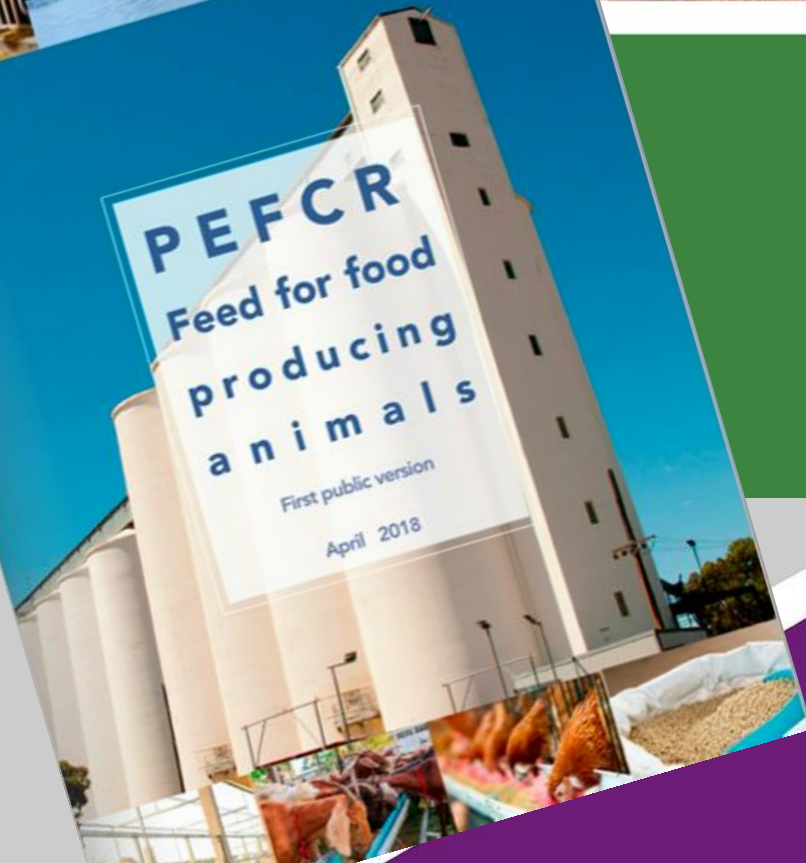
VERSION 1

Environmental performance of animal feeds supply chains

Guidelines for assessment

PEFCR Feed for food producing animals

First public version
April 2018



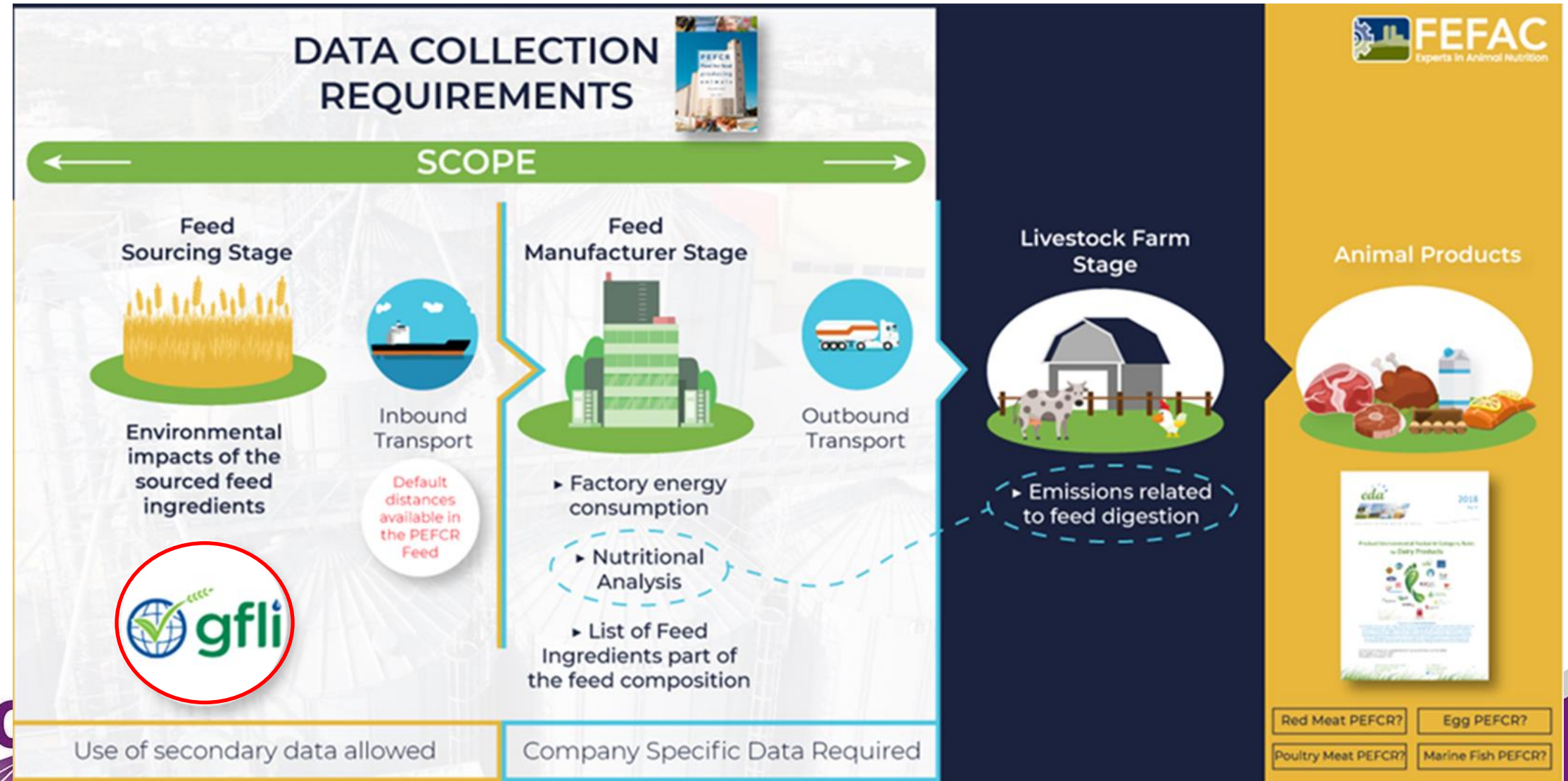
Transforming the livestock sector through the Sustainable Development Goals



VERSION 1

Environmental performance of feed additives in livestock supply chains

Guidelines for assessment





Feed circularity opportunities

Switching to non-human edible feed

- Source responsibly and maximise use of non-food materials

The soya supply chain



PRODUCTION

PROCESSING

TRADE AND CONSUMPTION



Local market


International market



The Use of Additives in Feed

Methane mitigation and feed additives

- There are a number of nutritional measures that can impact methane emissions. Improving feed quality and intake, lower fibre feeds and higher starch and fat diets all have a role to play.
- Methane reducing feed additives and supplements inhibit methanogens in the rumen, and subsequently reduce enteric methane emissions.
- Methane-reducing feed additives can be:
 - synthetic chemicals
 - natural supplements and compounds, such as tannins and seaweed
 - fats and oils
- To date, in UK legislation, no feed additive has been authorised for the function of delivering environmental benefits by reducing methane emissions.
- Defra are calling for evidence on these feeds with a view to considering policy options
- FSA are aware of the potential role for these additives and are in conversation with the industry to explore a regulatory pathway for such products.



*Enabling the UK Insect
Industry To Thrive*

Insect Industry UK™

22.03.2023

Insect Industry UK

Producers, Genetics, Technology Specialists, Start-up & Scale-ups



ENTOCYCLE



Working in support of modern, sustainable, commercial agriculture

Huge New Industry

“\$8 Billion market by 2030, +24.4% CAGR”



“Total demand for insect meal from the UK’s pig, poultry and salmon sectors to reach around 540,000 tonnes a year by 2050”



About the Black Soldier Fly



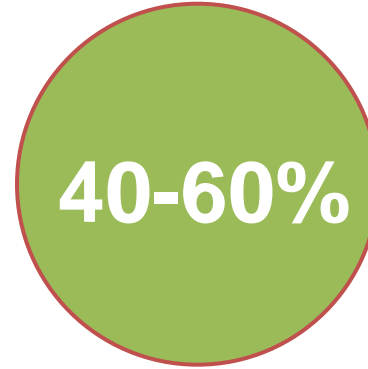
Hungry and fast-growing

8000x fold increase in size in 14 days



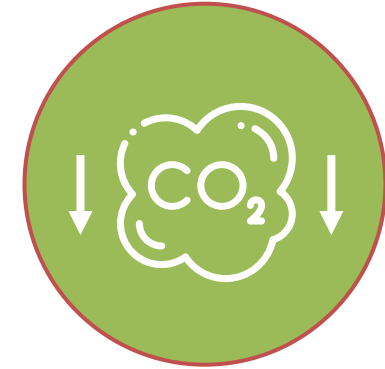
Omnivores

Eat a wide range of substrates



High in Protein

On a dry weight basis, and after processing.



Low Carbon Alternative

Reduces Greenhouse Gases by being locally produced

Why farm Black Soldier Fly Larvae?



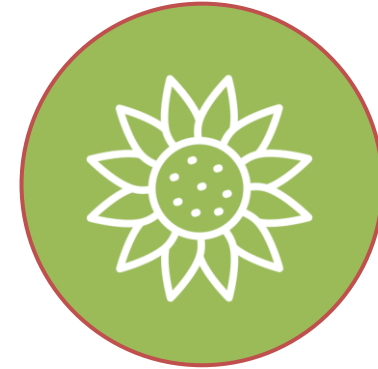
**Turn waste
into value**



**Produce a
protein with a
low carbon
footprint**



**Improve animal
nutrition with a
high-quality and
natural protein
source**



**Improve plant
health using
frass**

Challenge I : Approving Insect PAP's for use in Pig and Poultry Feed

**October
2021**

EU approves Insect PAPs

For use in pig
and poultry feed.
Aqua and pet
approved in 2017



The UK is behind

We can only feed
live larvae to
poultry and insect
PAPs to fish.



We need rapid approval

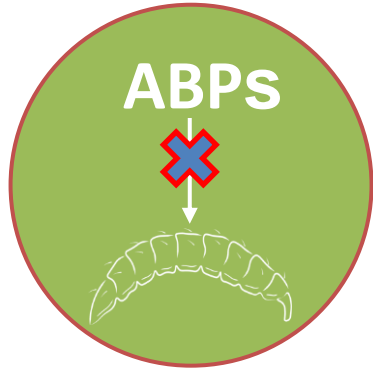
DEFRA can
leverage EFSA
risk assessments
and EC
legislation.



This helps our sector catch-up

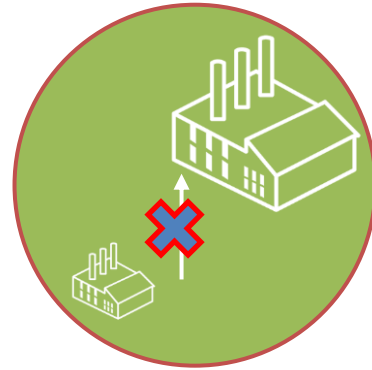
Both in terms of
legislation, and
opportunity to
scale.

Challenge II : ABP's Cat 3: The Ham Sandwich Dilemma aka Limited Substrates



We can't feed ABPs to insects

We can't feed PAPs to farmed insects, even though it's OK for pig and poultry.



Limiting overall feedstocks

And our industry's growth

Maintains high costs



We're working on this

FSA commissioned study is evaluating risks of insects grown on ABP's.



Approval allows us to access new feedstocks

Especially from supermarket and supply chain waste, allowing wider industry involvement.

Challenge III : Creating a Definition for Insect Frass



**Frass =
N,P,K**

**Frass is a
fertilizer**

Rich in nutrients
needed by plants,
boosts plant growth
and development
as well.



**1m
Tonnes/yr
by 2050**

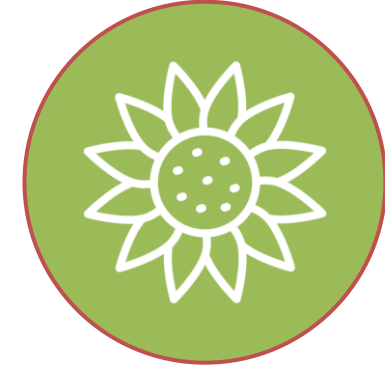
**Major product
of our industry**

Frass production
always exceeds
protein
production.



**The EU has
done the work**

Established legal
frass definition,
requiring it is
sterilized at 70°C
for one hour or
composting.



**The UK can adopt the
same legislation**

Enabling frass to be
used as an
alternative to
chemical fertilizers, at
a time when we need
them most (and not
classed as a waste).

Government support: Accelerating insect protein uptake



Insect protein can be CO₂ negative

Allowing offset of Carbon emissions.



On-farm protein source

Reducing soy usage, increasing supply chain resilience.



Diversification opportunity

Enabling farmers to adapt existing infrastructure.



Needs to compete on price point with traditional proteins

Subsidies for insect farming equipment will enable the sector to scale faster and increase usage.

Without government support, we will fall behind

In summary:

- The UK insects for feed industry faces a number of legislative challenges.
- These challenges can be addressed by considering analogous legislation from other countries and enabling legislative change rapidly.
- This will enable our industry to scale faster, bigger.

 **aic** • Conversely, without this rapid legislative change, we will fall behind.

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industries
confederation

Working in support of modern, sustainable, commercial agriculture

• The UK has an opportunity to be a global leader if legislation moves faster.

Help us grow our industry

**Be part of the next frontier in agri-food.
Enable the insect farming industry to take off.**



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Regulatory Support I: Subsidies for Insect Protein



- Insect Protein can be **CO₂ negative**, allowing offset of carbon dioxide emissions within the agri-food supply chain.
- It enables traditional farmers to produce a beneficial protein source on-farm for within their operations, or alternatively for use as a domestic product. This **reduces** the UK agri-food sector's **dependency on imported protein**.
- In parallel, it provides a diversification opportunity for farmers that can **create new revenues and create new jobs**.
- Uptake of insect protein is *limited due to price-point competition*.
- Regulation change can enable uptake by taking into account the **benefits of insect protein vs traditional proteins, and subsidizing insect production equipment or its use in animal feed.**

Challenge I : Approving Insects for use in Pig and Poultry Feed



- In October 2021, the **EU approved use** of processed insect protein in pig and poultry feed. [Link](#)
- The UK only allows processed insect protein for use in *aqua-feed* (2017), which occurred as a result of the EU approving it pre-Brexit. [\(Link\)](#)
- Until approval is given, UK poultry can **only be fed live insects - small market**
- **UK government and regulators can-fast track this approval** by reviewing the adopted legislation from the EC and risk assessments approved by EFSA, take it to consultation and drive rapid legislative change.
- Approval eliminates a key regulatory barrier for UK agri-food to use insect protein and **puts the UK on an even footing with the EU.**

Challenge II : Limited Permissible Substrates



- The 'Feed Ban' laws prevent farmed insects being fed Processed Animal Proteins (PAPs) (except fishmeal).
- Yet aquafeed can contain pig and poultry PAPs, and in the EU poultry feed can contain pig PAPs and pig feed can contain poultry PAPs.
- We need to be able to use food waste containing non-ruminant PAPs (e.g. an out-of-date ham sandwich) as feed for insects. Without this, the UK insect farming industry will have limited growth.
- **By establishing this legislation, the UK can go beyond the EU status quo, further limit food waste that goes to landfill & capture more of this \$8 Billion market**

Challenge III: Creating a definition for insect frass




- Insect frass is comprised of skin casings and droppings, and is a product of the insect-farming process. It contains Nitrogen, Phosphorus and Potassium, making it a valuable natural fertilizer. It also acts as a natural biorepellent, boosting plant growth and deterring pest damage.
- Frass is a major product of our industry - up to 500,000 tonnes of frass per year could be produced by 2050.
- The EU has recently established a definition for frass to ensure it can be used on agricultural land ([Link](#)). It requires that frass is sterilized at 70°C for one hour. Frass was then added to the list of authorized fertilizers ([Link](#)).
- UK government should adopt a similar definition and authorization, ensuring frass can be used as an alternative to chemical fertilizers.
- It is also key that frass is not classed as a waste, since this useful and valuable material would otherwise become a cost centre for our industry.

Growing Support



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Industry To Thrive*

Insect Industry UK™

Thank you

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YEAR
ANNIVERSARY

APPG on Science and Technology in Agriculture
UK animal feed sector – innovation, sustainability and Net Zero



Former Food Processing



Presented by John Knight

Chair of The UK Former Foodstuffs Processors Association (UKFFPA)

& Technical Director for the SugaRich Group



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The UKFFPA was set up in 2013

It represents, defends and promotes the interest of the Former Foodstuffs processing industry to UK institutions. It provides guidance to its members in sourcing and producing safe former foods

The members handle over 650 000 tonnes per annum which represents over 90% of the former foods being processed in the UK

Using former foodstuffs as animal feed saves the equivalent of 750 000 tonnes of wheat which could make 1.4 billion loaves

It's activities at UK level are complementary to those of the European Former Foodstuffs Processors Association (EFFPA).



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Former Foods the Unintended Products

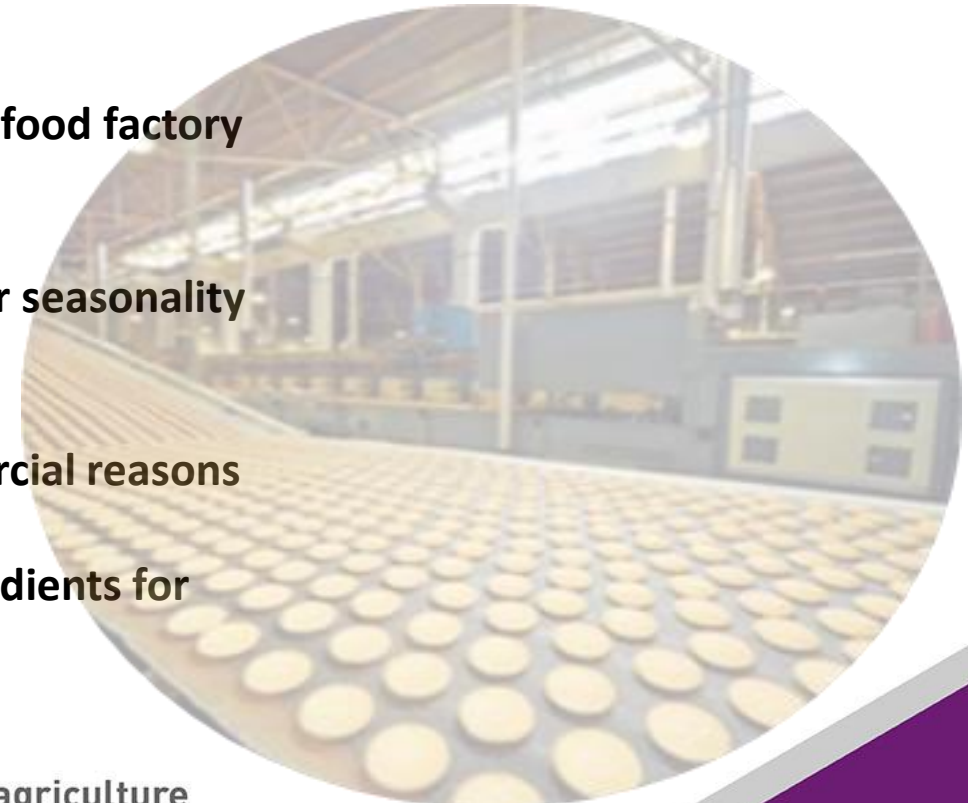


**Food losses are both unintentional and unavoidable
95% of the products that our members use, arise at the food factory
as intermediate, unfinished or incorrect products**

**Food products in the retail sector are often removed for seasonality
and for commercial reasons**

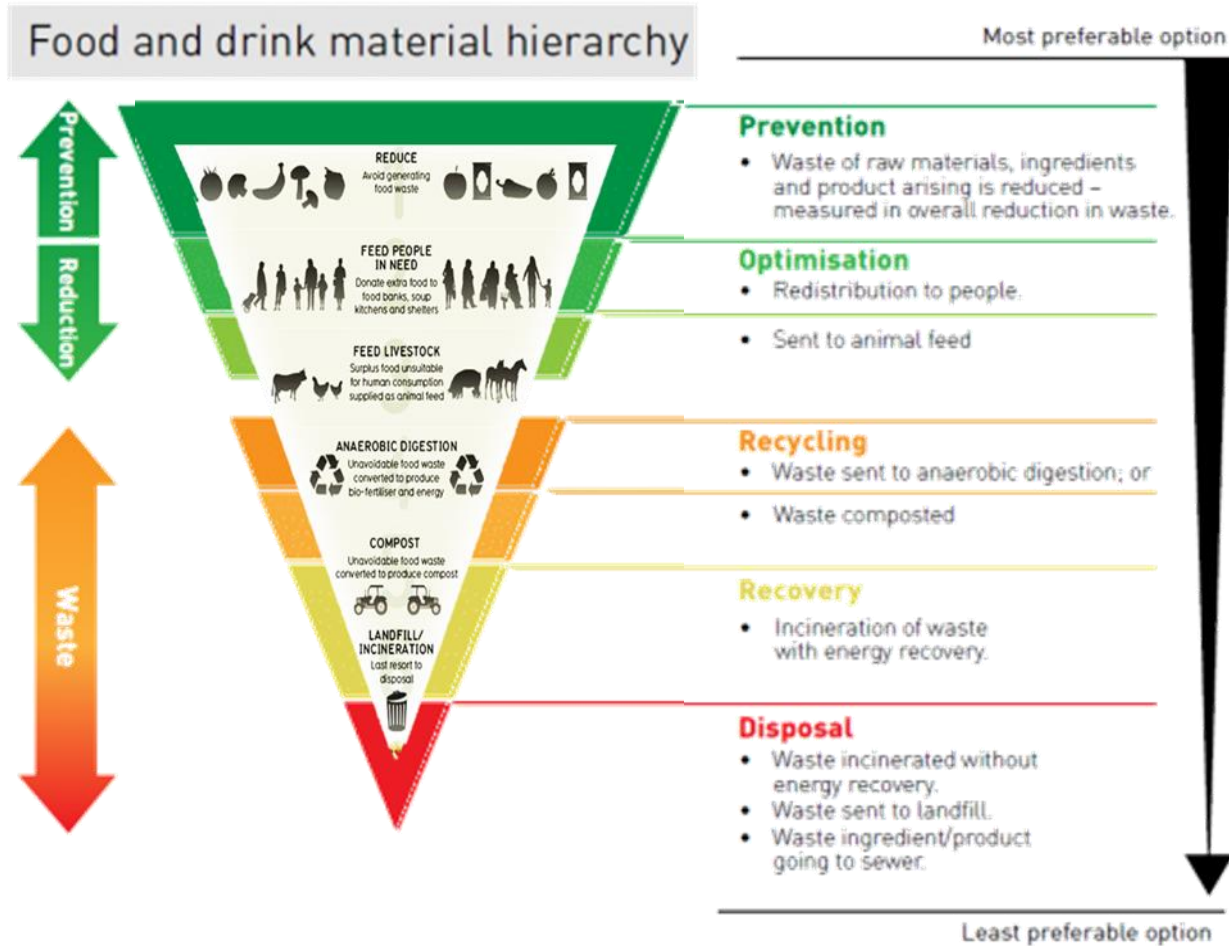
Products are removed from the market only for commercial reasons

**They are never waste but can become high energy ingredients for
animal feed**

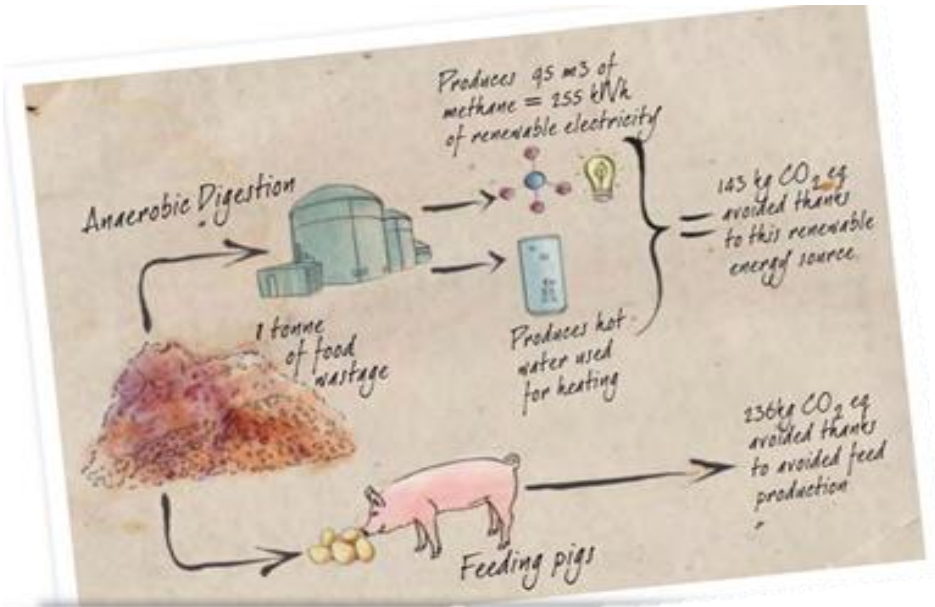


| | Processed former foodstuffs – Typical Blend for Pig Feed | Barley | Wheat |
|----------------------------------|---|-------------|-------------|
| Dry matter | 88.0% | 88.0% | 88.0% |
| Crude protein | 10.0% | 10.0% | 11.0% |
| Lysine | 0.38% | 0.38% | 0.34% |
| Crude fat | 14.5% | 2.8% | 2.1% |
| Crude fibre | 2.2% | 5.5% | 2.7% |
| Starch | 41.0% | 51.6% | 59.2% |
| Sugar | 14.0% | 2.2% | 2.4% |
| Metabolisable energy pig (DE) | 16.75 MJ/kg | 12.95 MJ/kg | 14.43 MJ/kg |

FEED NOT WASTE



Source
WRAP Guidance
for Food and Drink
Manufacturers and
Retailers on the
Use of Food
Surplus as Animal
Feed



- In 2021 the GFLI database listed UK Former Foods as having an environmental impact of between 0.03 and 0.16 Kg CO₂ eq/ Kg of product compared with UK wheat at 0.43 and imported palm oil at 9.23 Kg CO₂ eq / Kg of product

Nearly twice the amount of CO₂ is saved using former foods for feed rather than bio-gas. (Source FAO Food Waste Footprint).



Embracing Technology

SELECT WASTE REASON

| | | |
|----|---------------------|--|
| 1 | BREAKDOWN | |
| 2 | QUALITY | |
| 3 | CONTAMINATION | |
| 4 | CRUMB | |
| 5 | INGREDIENT ERROR | |
| 6 | FLOUR | |
| 7 | RFID | |
| 8 | SEMOLINA | |
| 9 | SEED (PLANT ONLY) | |
| 10 | STORES DATE EXPIRED | |

PAGE 1 OF 2

SELECT PRODUCT

| | | |
|------|-----------------------|--|
| 1111 | BREAD CRUMB | |
| 1112 | SEMOLINA | |
| 1115 | MP LONG LOAF 800G | |
| 1123 | NUTTY BROWN 800G | |
| 1128 | MP LONG LIFE 800G | |
| 1166 | WHITE 400G | |
| 1416 | OWN LABEL W/MEAL 800G | |
| 1526 | W/MEAL 800G | |
| 1527 | WHITE 800G | |
| 1561 | W/GERM 400G | |

PAGE 1 OF 5



www.sugatrak.com/Dashboard/Index

SugaTrak Dashboard Skip Changes Waste Bins Levels RFID Cards Emails Admin Actions - Hello paul.pearson@sugarecycle.co.uk Log off

Select Compactor **TPM Compactor Bay12**

Filter
Start Date: 05/04/2017
End Date: 05/04/2017
Update

Compactor (ID: 40)

| | |
|------------------------|------------------------------|
| Report Period | 05/04/2017 |
| Number of Bins Loaded | 6 |
| Average Bin Weight | 161.8 kg |
| Total Waste In Period | 971 kg |
| Live Weight | Last Skip |
| 11028 kg (100%) | 11173 kg - 31/03/2017 |

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Waste By Line

| | |
|-------------|--------|
| Line 6 | 59.32% |
| Buhler Line | 22.25% |
| Line 4 | 15.00% |
| Knobel | 2.83% |



Looking Forward



UKFFPA will

- Work with Government and Industry to capture those former foods that are presently going to waste
- Look for synergies with the Insect Farming Industry
- Drive further efficiencies through new technology



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In summary



Former Food Processors are

- In the heart of the food-feed circular economy
- Provide a sustainable solution for food operators (industry and retailers) to prevent food waste
- Provide an alternative and sustainable high energy ingredient for animal feed
- Always keeping in mind that safety and traceability will always be our priority

• Thank you for your attention.



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