

Building on Sustainability

Carbon Footprint & BQAS

January 2011

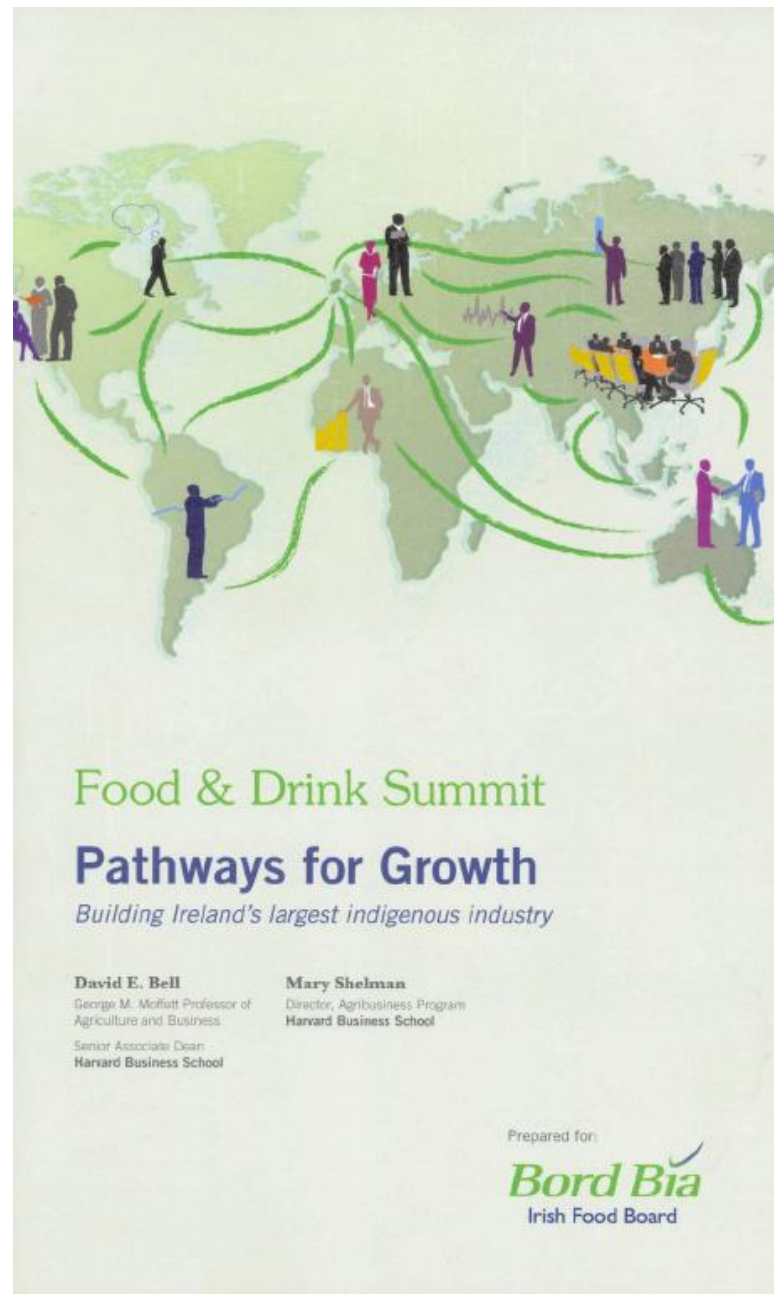
Growing the success of Irish food & horticulture

Bord Bia
Irish Food Board

Outline

- ✓ **Why?**
- ✓ **About Greenhouse Gas Emissions**
- ✓ **BQAS pilot programme**
- ✓ **Incorporation of sustainability into QAS**

Strategy



IN PREPARATION
FOR LIVING UP
TO THE CLAIM OF
BEING OPEN FOR
INSPECTION, FOOD
AND AGRICULTURE
COMPANIES MUST
TAKE TO HEART
THE NEED FOR
SUSTAINABILITY AND
TRANSPARENCY IN
FOOD PRODUCTION.

Growing the success of Irish food & horticulture

Retailers building it into their value proposition

- ✓ Strong communication of activity
- ✓ Doing the work for consumers
- ✓ Seeking to gain market share



Growing the success of Irish food & horticulture

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Retailer Perceptions of Sustainability & Ireland

- ✓ Environment gaining importance, but not yet well understood by consumers

Sainsbury's

Consumers want to make the right environmental choices but are not actively judging products against environmental criteria

- ✓ Good acknowledgement of credentials of Irish food



The fact that an Irish farm was chosen as the McDonalds Flagship Farm for beef in Europe indicates Irish farms are doing good things and can farm in a sustainable way

- ✓ However, perception of Ireland being defensive on emissions



On CO₂ Irish agriculture has a negative image in Holland especially with NGOs

Considerable opportunities

- ✓ Ireland viewed as a trustworthy source of food products
- ✓ Seen as having considerable natural advantages
- ✓ In many cases, we are viewed as “almost local”
- ✓ Seen as strong performers in areas such as animal welfare
- ✓ Retailers/manufacturers are open to proactive approach
- ✓ Potential to grow market share and value over time

Potential long term benefits

- ✓ Benefits can be at three levels:
 - Help maintain market share
 - Long term potential to drive volume & value growth
 - Potential to identify efficiency gains

- ✓ However, issues to be overcome
 - Some perceptions of being on the “defensive”
 - Consumer understanding of our points of differentiation not clear
 - Need to ensure we have the science to back up any claims

Greenhouse Gases (GHG)

General term for gases which have a Global Warming Potential

Carbon Dioxide

Methane

Nitrous Oxide

Refrigerant Gases

CO₂ equivalent

1

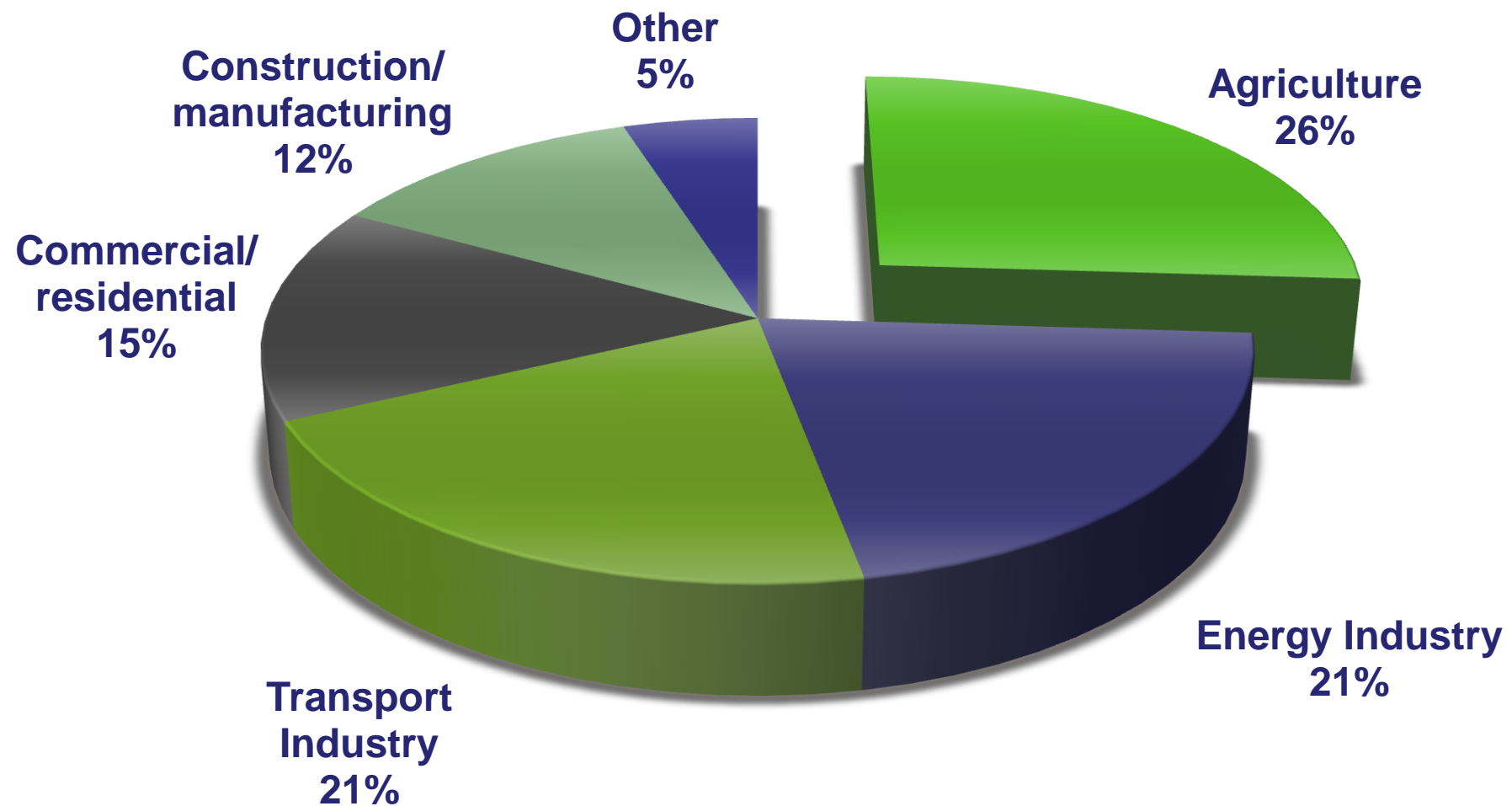
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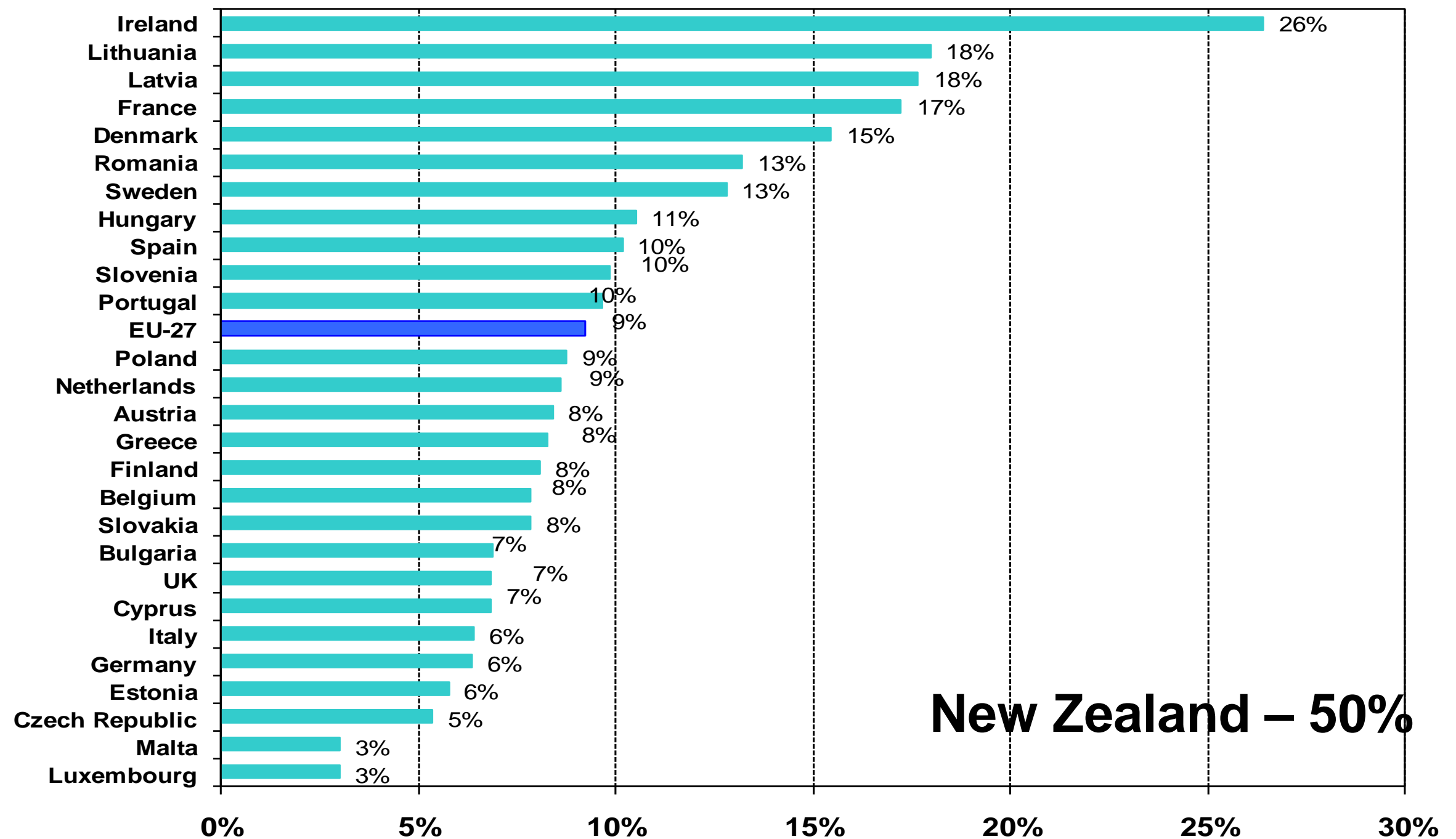
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Where does Agriculture & Food fit in?

Distribution of Irish GHG Emissions, 2008



Proportion of GHG from Agriculture



Measuring and communicating product carbon footprints



On Pack

Point of Sale

Brochure /
Consumer
Education

Website

- Approximately £1.5 billion p.a. sales revenue of products labelled
- £7 billion p.a. sales revenue of products certified.



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PAS2050

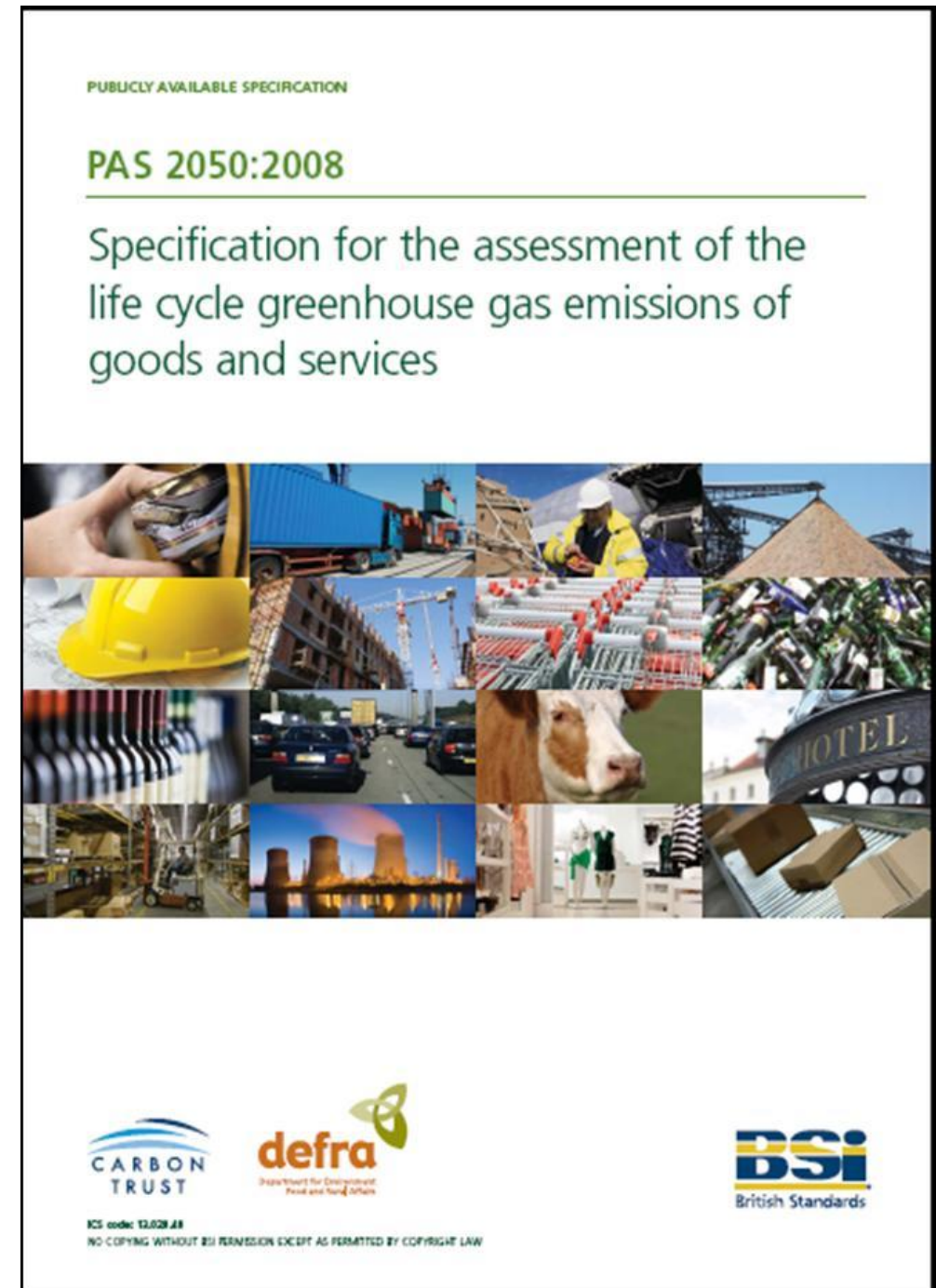
Defines methodology for measuring
Carbon Footprints

Publicly Available Specification

Developed through the BSI British
Standards

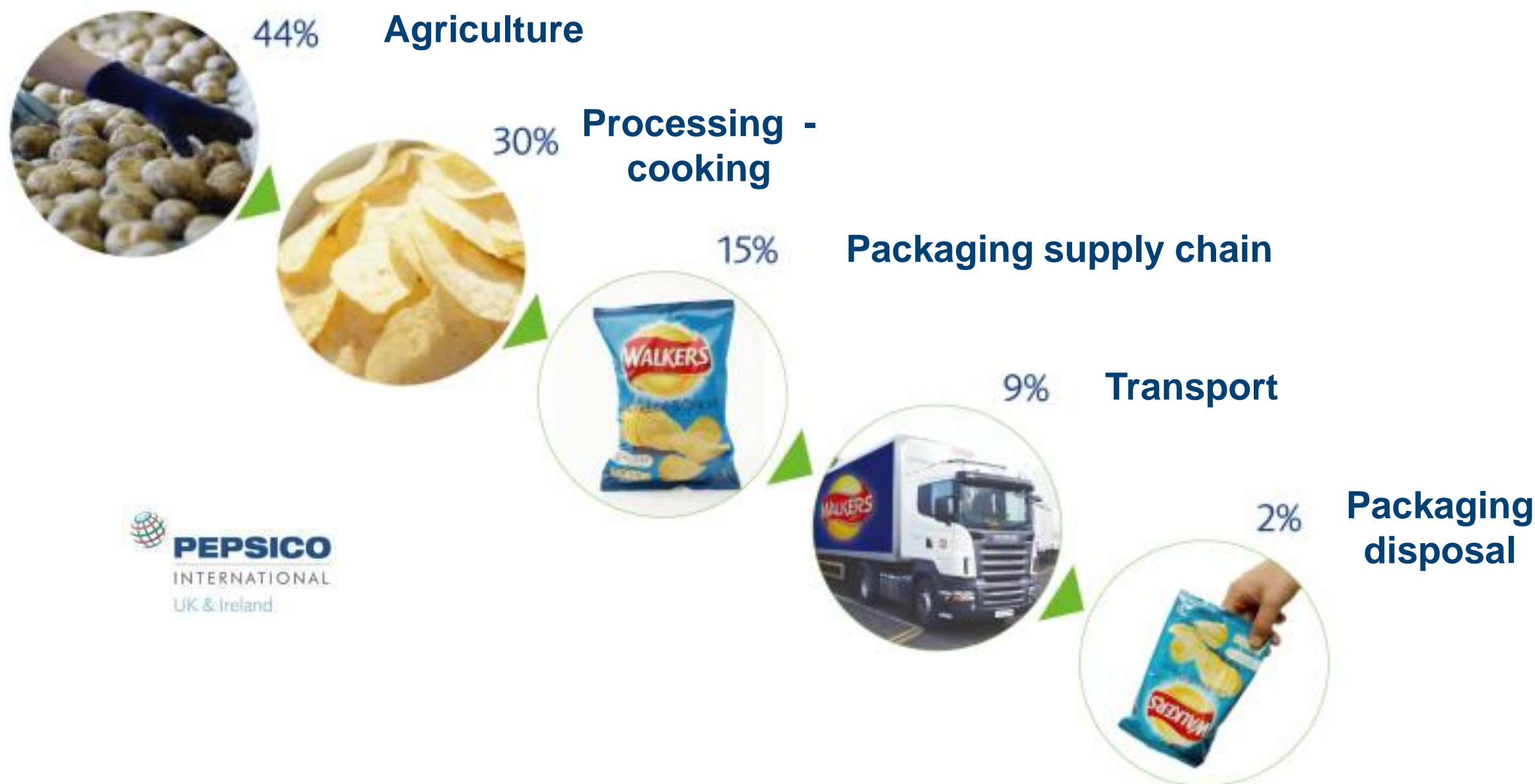
Sponsored by the Carbon Trust and Defra

Published by BSI in October 2008



Walkers Crisps – Carbon Footprint Label

“A 35gram bag has 75grams of CO₂”



Scope of the Full Project



**Farming
(Pilot)**



Processing



Packing



Transport



Retail

**Focus to date has been
on farm element**

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BQAS Pilot Programme

- ✓ 200 farms from Beef Quality Assurance Scheme
- ✓ Covering different production systems
- ✓ Develop model for footprint calculation
- ✓ Identify strongest performing areas and those with room for improvement
- ✓ Get results independently certified

Project Plan

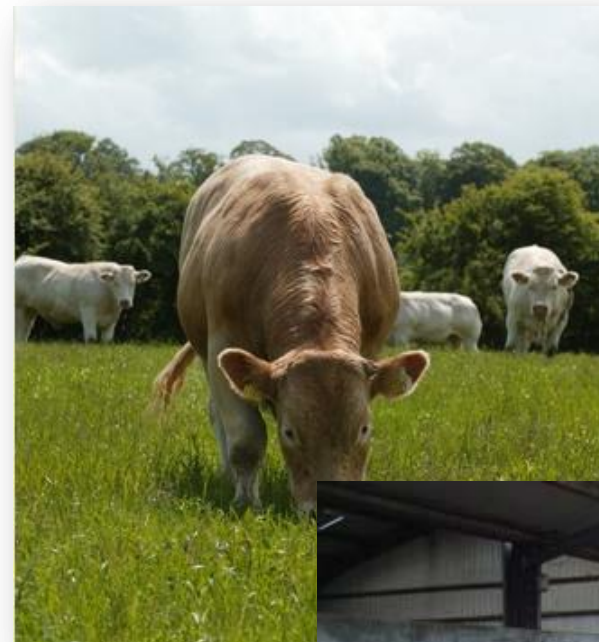
- ✓ Develop questionnaire
- ✓ Selection of representative sample of farms
- ✓ Recruit farms
- ✓ Training surveyors & carry out farm surveys
- ✓ Develop calculation engine
- ✓ Input survey results
- ✓ Verify measurements
- ✓ Feedback to farms

Farm Data and Information



Enterprise details

- Farm size / system
- Environmental details (REPS)
- Number, age, breed, sex
- Movements, dates, weights, grades
- Housing type,
- Housing date, period
- Calving interval / pattern



Animal Feeds

- Grass / forage / concentrates
- Home grown / bought in



Carbon Footprinting - Farm Questionnaire

Herd: B1111111 ▼ Herd owner: Joe Bloggs. Tel: 0000000000 - . Auditor: . Date of audit: 30/06/2010.
Finalised: 12/11/2010. Reviewed on 16/11/2010

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1. Farm Information

Farm Size (Inc Rented) 73.54 ☐ Acres ☒ Hectares

Farm Size Rented 23.51 ☐ Acres ☒ Hectares

Type Of Farming ☒ Conventional ☐ Organic ☐ Converting ☒ ICBF ☒ SCWS

REPS ☐ Yes ☐ No

Teagasc Client ☐ Yes ☒ No

REPS Options

Headgerow Added 200 metres

Headgerow Removed 0 metres

Headgerow Total 5959 metres

Sp Area Conservation 1.2 ☐ Acres ☒ Hectares

Habitat ☐ Acres ☒ Hectares

Tree Planting 40 number

Forest ☐ Acres ☒ Hectares

Clover 5 ☐ Acres ☒ Hectares

Other (Specify) - ☐ Acres ☒ Hectares

4. Cattle Numbers

8 records

	Type	Nos on Farm Jan 1	Deaths	Avg Date Died	End Of Year Total
Update	0-12m F	18			23
Update	0-12m M	20	2	1 Mar	20
Update	12-24m F	16	1	1 Oct	13
Update	12-24m M	7			20
Update	24m+ F	0			0
Update	24m+ Replacements	3			5
Update	Breeding Bull	1			1
Update	Suckler Cows	32	0		37

Add Cattle Record

Animal Type	<input type="text" value="Select..."/>	*
Numbers On Farm Jan 1	<input type="text"/>	
Deaths	<input type="text"/>	
Avg Date Died	<input type="text"/>	dd/mm
End Of Year Total	<input type="text"/>	

Save

Farm Data and Information

✓ Manure management

- Storage
- Application method



✓ Fertiliser usage

- Type / quantity
- Spreading dates



✓ Fuel & Chemical use

- Diesel / Petrol
- Electricity
- Sprays etc

✓ Water use

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9. Fertiliser used to supply beef enterprise (grass, silage)

11 records

	FertiliserName	Tonnes	N	P	K	ApplicationDate	Hectares
Update	18-6-12	2	18	6	12	15 Apr	
Update	C.A.N	2	27	0	0	1 May	
Update	C.A.N	3	27	0	0	20 Jun	
Update	C.A.N	5	27	0	0	16 Apr	
Update	C.A.N	2	27	0	0	8 Aug	
Update	C.A.N	3	27	0	0	1 Sep	
Update	CUT SWARD	2	27	5	10	16 Apr	
Update	Pasture Sward	2	27	2.5	5	20 Mar	
Update	Pasture Sward	2	27	2.5	5	4 Jul	
Update	Pasture Sward	1	27	2.5	5	20 May	
Update	Urea	3.25	46	0	0	25 Feb	

Add Fertiliser Record

Fertiliser Name

Select...

Tonnes

N

%

P

%

K

%

Application Date

dd/mm

Hectares

☐ Acres ☒ Hectares

Save

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16. Fuel Use - Own Tractor/Equipment

Fuel Type	Litres	% used for Beef
Diesel	6000	50 %
Petrol	250	50 %
Other: <input type="text" value="Select..."/>		%

Total Electricity Use KWh

% used by Beef Enterprise %

Electricity Provider

Own Generation Type

Own Generation KWh KWh

Section 16 Notes

VERIFIED BY ESB BILLS FOR 2009.
JEEP AND TRACTOR DIESEL USAGE
HIGH BECAUSE ANIMALS HAULED TO
AND FROM MARTS/FACTORIES AND
FEED HAULED ONTO FARM

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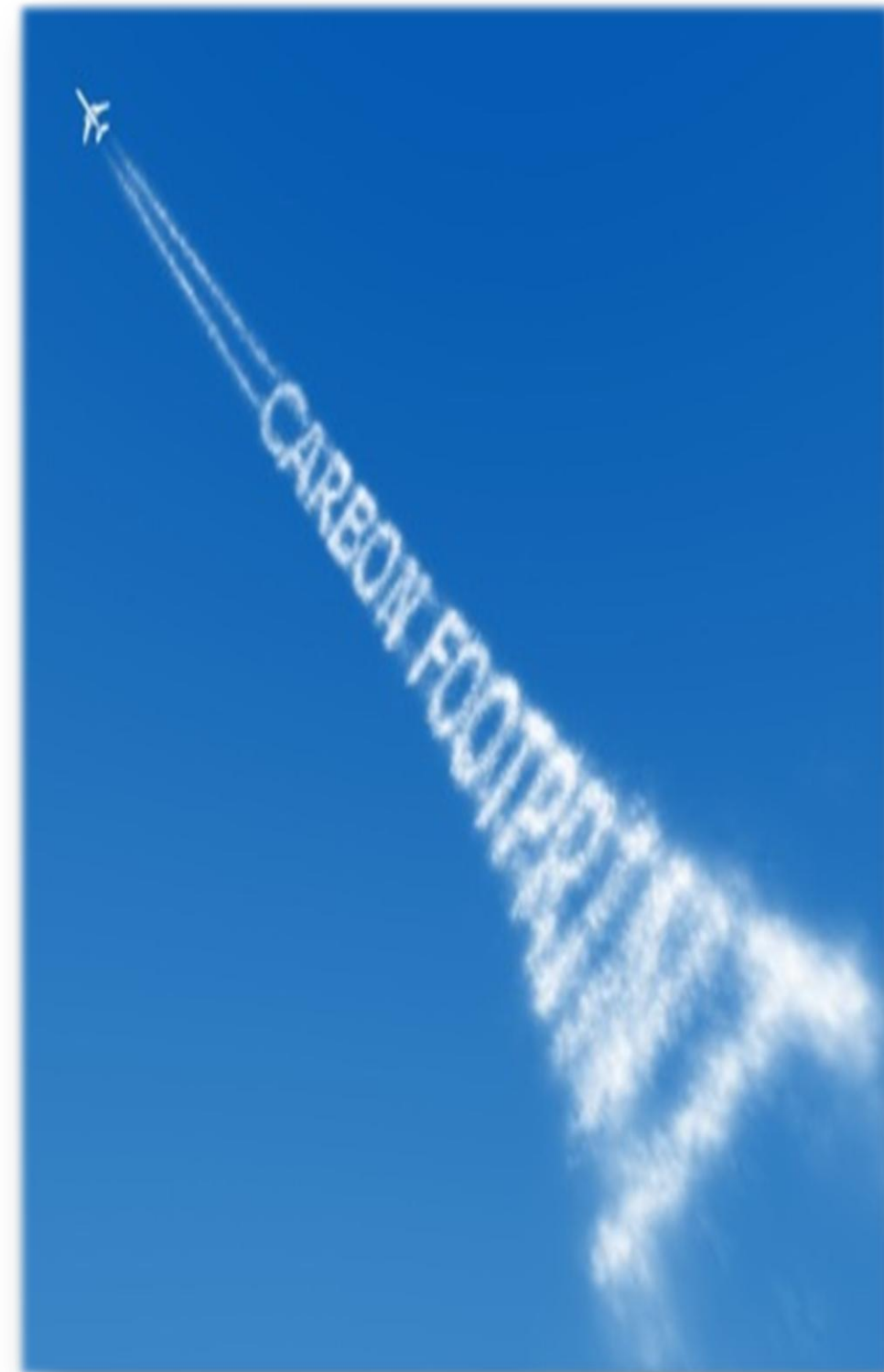
Model Development

✓ Calculation Engine

- Developed with Teagasc
- Input from Carbon Trust
- All stages validated

✓ Accreditation

- Approved by Carbon Trust
- Farm element expected in Jan/Feb
- Other elements to follow



Calculation Engine

1	FARM SURVEY DATA												
2	DEFAULT VALUES												
3													
4	Farm Details												
5	Farm size (ha)	47.20											
6	N fertiliser application (kg ha)	61.00											
7	Beef produced per year (kg)	12000.00											
8	Lime application (kg ha)	0											
9	Diesel used on farm (l)												
10	Contractor diesel used (l)												
11	Expenditure on Electricity (euro)												
12	Farm electricity consumption (kw)	702.416918											
13													
14	Animal and feed profile												
15	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
16	Housing												
17	Days in month	31	28	31	30	31	30	31	31	30	31	30	31
18	Number of days housed	31	28	31	15	0	0	0	0	0	0	23	31
19	Animal numbers												
20	Total	27.68	27.23	27.20	32.55	31.66	30.78	30.32	30.27	30.23	30.18	29.58	28.56
21	Feeding data												
22	Pasture (kg/d)	0.00	0.00	0.00	5.26	14.74	11.41	11.31	10.91	11.30	11.06	2.48	0.00
23	Conserved grass (silage hay, haylage, etc.) (kg/d)	6.13	5.86	7.47	5.66	0.00	0.00	0.00	0.00	0.00	0.00	9.49	8.95
24	Alternative forage (kg/d)												
25	Milk (kg/d)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	Concentrate (kg/d)	0.51	0.50	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51
27	Other												
28	Animal wt												
29	kg	624	609	589	565	575	606	611	616	621	625	630	632
30	DMD of diet (g/kg DM)												
31	Pasture	820	820	810	800	790	780	770	760	750	740	730	0
32	Conserved grass (silage hay, haylage, etc.)	720	720	720	720	720	720	720	720	720	720	720	720
33	Alternative forage	700	700	700	700	700	700	700	700	700	700	700	700
34	Concentrate	896	896	896	896	896	896	896	896	896	896	896	896
35	Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	Nitrogen concentration of diet (g/kg DM)												
37	Pasture	0	40	36.8	37	38	40.4	39.2	39	38.8	37.5	36.32	0
38	Conserved grass (silage hay, haylage, etc.)	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8	20.8
39	Alternative forage (e.g. maize)	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5
40	Concentrate for growers	22.242	22.242	22.242	22.242	22.242	22.242	22.242	22.242	22.242	22.242	22.242	22.242
41	Concentrate for finishers	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25	19.25
42	Other												
43	Milk	0.00	0.00	5.30	5.56	5.61	5.62	5.76	5.96	6.24	0.00	0.00	0.00

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Animal Emissions

OUTPUT TABLE	
Total GHG profile as CO2 equivalents	
Enteric fermentation CH4	56,271.04
Excretas (storage and spreading) CH4	10,615.93
Excretas (storage and spreading) N2O	2,180.37
Excretas (grazing) NH3	349.80
Excretas (storage and spreading) NH3	1,522.41
Excretas direct animal shedding N2O	19,433.17
Silage effluent CH4	0.00
Farm inputs concentrate CO2 equ	557.24
Nitrate leaching N2O	3,213.90
Total animal group emissions	94,143.85

General Farm Emissions

Emissions from chemical fertiliser application and production	
Fertiliser use (kg N/ha)	61.00
Total farm use (kg)	2,879.20
N ₂ O emissions (kg)	56.56
CO ₂ equivalents year (kg)	16,740.49
Fertiliser production	
Total CO ₂ equivalents (kg)	20,471.11
Nitrous oxide from nitrate leachate	
N applied kg	2,879.20
Nitrate leaching kg	287.92
N ₂ O from leached nitrate	11.31
CO ₂ equivalents (kg)	3,348.10
Electricity production	
Total usage kWh	702.42
CO ₂ equivalents (kg)	456.57
DIESEL EMISSIONS FROM ON-FARM AND CONTRACTOR OPERATIONS	
On-farm diesel use	0.00
On-farm diesel use (CO ₂ e)	0.00
Production of on-farm diesel (CO ₂ e)	0.00
Contractor diesel use	0.00
Contractor diesel use (CO ₂ e)	0.00
Production of contractor diesel (CO ₂ e)	0.00
Total general farm emissions	
	41,016.27

Final Calculation

Total Emissions

Animal Emissions

94,144

+

Farm Emissions

41,016

=

135,160

CO₂E = Total Emissions / Kg of Beef Produced

135,160 / 7,000

=

19.3 CO₂E

Feedback to Farmers

- ✓ Carbon Footprint Number (CO₂ / kg beef)
- ✓ Key improvement areas for the farm
- ✓ Performance v peers in group: CO₂, DLWG
- ✓ Other options
 - Adding clover to permanent pasture
 - Potential for improvement in feed efficiency
 - Planting carbon sinks (hedgerows)

Incorporating learning's into BQAS

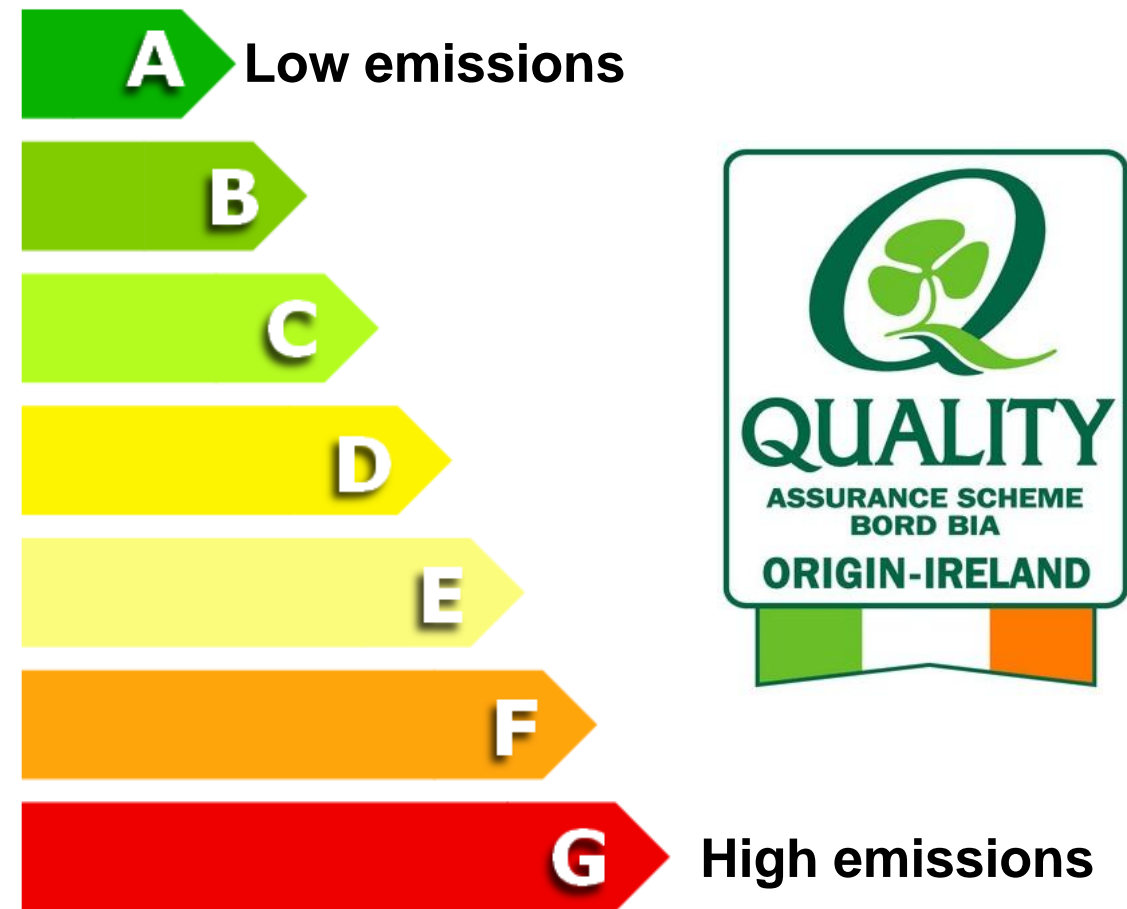


Focus will to be on:

- Amount of beef produced
- Outdoors/Housing
- Manure management
- Feeding regime



Run in conjunction with revised BLQAS rolling out Jan 2011



1st National Quality Assurance Scheme to measure Environmental Sustainability criteria in parallel

What are the right metrics for food production?

Kg per hectare of land?

Kg per M3 of water?

Calories per hectare?

Calories per unit of N, P, or K?

Grams of protein per hectare?

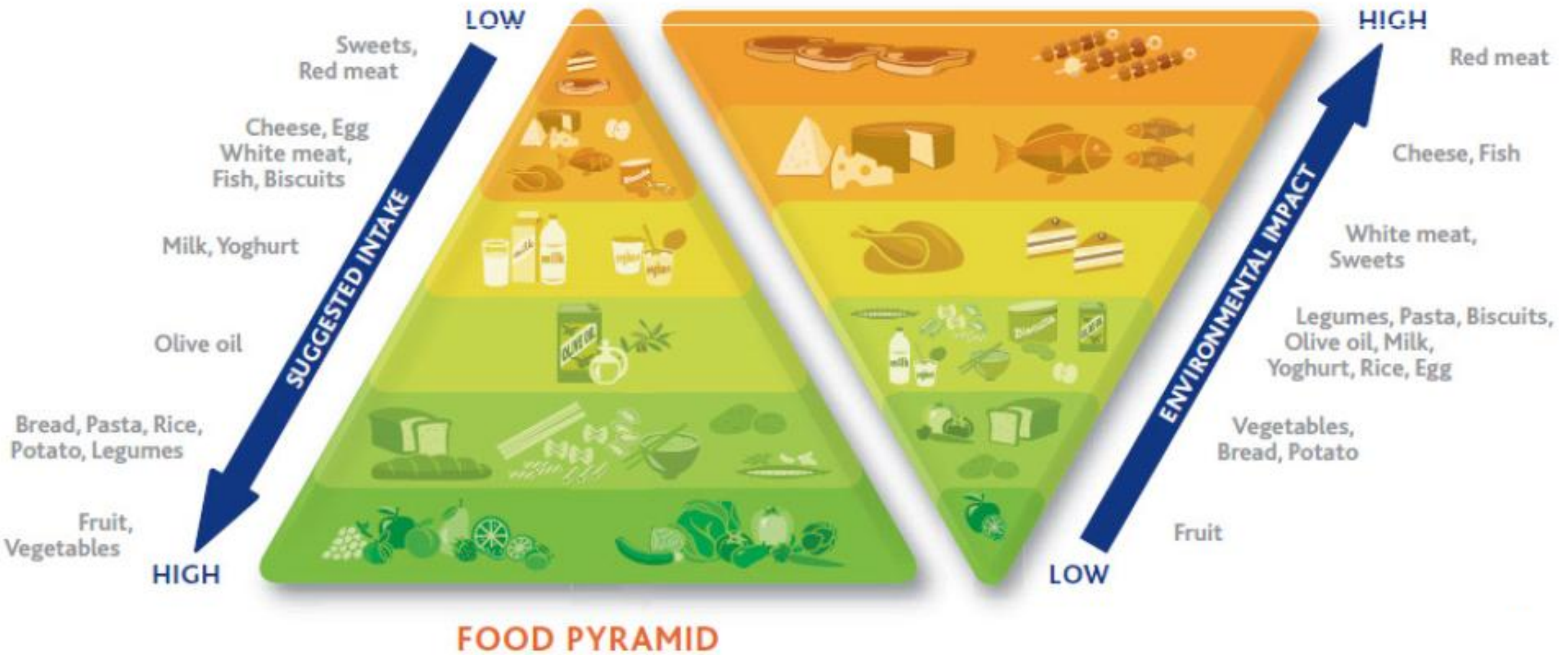
Key nutrients per hectare?

Grams of protein in per grams of protein out?

Farmer income?

from J Clay, WWF

ENVIRONMENTAL PYRAMID



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