



Increasing Public Confidence in the Recycling of Organic Resources: Considerations from a chilled food perspective

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Content

- **The unique UK chilled prepared food sector**
- **Agricultural issues** - waste as an input
- **Waste outputs** – why, what, how much, where
- **Requirements/challenges**

UK Chilled Prepared Food

Consumer confidence & trust: safety, quality

- **£8.5bn+ UK retail market**
 - 9,000 SKUs made by CFA members at any one time
 - Factories produce 30-40 different foods each day
- **Just in time manufacture**
- **Dedicated supply chain, integrated control, own/contract growers**
- **95% retailer own label, no manufacturer contracts**
- **Very few finished product imports**
- **Largely RTE – hygiene critical**

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Chilled Food Characteristics

- **Short shelf life ingredients and final products**
 - **Perishable waste requires efficient disposal routes**
- **Multicomponent products**
 - Complex ingredients streams → **heterogeneous waste**
 - Animal derivatives content 0-100%, but large proportion of foods within 5%-25% range
 - **50-70% moisture**
 - Remainder: carbohydrate, e.g. bread, pasta, produce
- **Potential for re-working generally low**

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UK Retail Chilled Prepared Food

- Dressed salads
- Leafy salads
- Prepared Vegetables
- Prepared fruit
- Stir fry kits
- Sandwiches
- Sandwich fillings
- Quiche/flans
- Pizza
- Recipe dishes/kits
- Meal Accompaniments
- Sushi
- Filled fresh pasta
- Soups
- Sauces
- Desserts

2008 retail value ~£8.5bn, equating to ~3.5Mte

CFA Sustainability Activities

Completed:

- Defra **Sustainable Food and Farming Research Priorities Group** 2003-7
- Defra-funded research by PICME: **Chilled Food Manufacturing Waste Minimisation Study** (FT0351) 2005
- Defra **Food Industry Sustainability Strategy Champions Group on Waste** 2006-8
- Defra-funded research at IFR: **Factors affecting the attachment of bacteria to, and their detachment from, prepared fruit and vegetable tissues** (AFM 234) 2005-8
- Defra-funded PhD at Imperial College: **Sustainable Waste Management in the Chilled Foods Sector** (FT0348) 2004-7

CFA Sustainability Activities

Ongoing:

- Leading LINK-supported £750k research: **Sustainable Shelf Life Extension** (SUSSLE) (AFM266): 2008-11
- WRAP **use of waste on agricultural land** and subprojects including risk assessment for the use of source-segregated composts in UK agriculture: 2008-10 (?)
- Sheffield Hallam University: **Domestic v Industrial Lasagne production – waste and energy comparison**: 2008-9
- Defra-funded Cranfield/IGD: **Evidence on the role of supplier-retailer trading relationships & practices on waste generation in the food chain** (FO0210) 2008-9
- Defra-funded OU: **Attitudes towards the Use of Organic Resources on Land** (WR0510): 2007-9

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Agricultural issues: waste as an input



Agricultural issues - waste as an input

- **Consumer confidence and trust**
 - **Unrivalled standards in place in the UK retail chilled prepared produce supply chain → exceptional record**
- **Food safety**
 - Microbiological
 - Chemical
 - Physical
- **Quality**

Agricultural issues - waste as an input

- **Food safety**
 - **Microbiological**
 - Bacteria:
 - Vegetative: VTEC, Shigella, Salmonella, Listeria
 - Sporeformers: Bacillus cereus, Clostridia
 - Viruses
 - Parasites
 - [Plant pathogens]
 - **Chemical** including allergens – animal- and plant-derived
 - **Physical** – foreign bodies
- **Quality**, e.g. **vegetarian pedigree**



UK Chilled Prepared Food

- **Dressed salads**
- ***Leafy salads**
- **Prepared Vegetables**
- **Prepared fruit**
- Stir fry kits
- **Sandwiches**
- **Sandwich fillings**
- **Quiche/flans**
- Pizza
- **Recipe dishes**/kits
- Meal Accompaniments
- **Sushi**
- Filled fresh Pasta
- Soups (some RTE)
- Sauces
- **Desserts**

Items in green include raw ready to eat produce inc garnishes

***Leafy salads (1990+):** UK: 2.7×10^9 packs, Worldwide: 2×10^{10} packs



CFA Produce WG

- 1996
 - *E coli* O157 fatalities linked to contaminated produce
 - 9,000 ill, reportedly linked with radish sprouts (Japan)
 - 'red leaf lettuce' (USA)
 - European Chilled Food Federation VTEC WG formed
 - Identify and break the chain of contamination/infection
- 1997
 - WHO EHEC infections consultation
 - CFA research priorities
 - Organic materials use on land + other vectors, e.g. irrigation water, animals
 - Growing conditions/agricultural practices
 - Handling issues
 - Location of organisms in/on crops

CFA Produce WG



- **1998**
 - ECFF VTEC & Agriculture Report
 - Presented to European Commission 1999
 - Presented EC SCF 2000 → 2001 EC produce risk assessment
 - ADAS Safe Sludge Matrix (UK law yet??)
- **2000+**
 - FSA FYM activity
- **2002**
 - CFA growing controls (MGG1) published
 - Field controls - critical to assuring safety
 - Assured Produce (elements), retailers' protocols
 - CODEX leafy vegetables + sprouted seeds
- **2005**
 - FSA sprouted seeds guidance meeting



CFA Produce WG

- **2005-8**
 - **£100K CFA/Defra/IFR pathogen attachment research**
- **2007**
 - **CFA Micro Guidance for Growers 2 (MGG2) published** supported by BLSA, FPC, HDC, NFU, Health Protection Agency, (+ACMSF? + FSA?)
- **2008**
 - **UN CODEX** code annex on leafy veg and herbs
 - **UN FAO/WHO Expert Group:** leafy veg + herbs
 - **WRAP, OU** etc
- **2009**
 - **FSA FYM guidance to be published?**
 - **What about small growers?**
 - **Assured Produce protocols – to be MGG2-based**

CFA inputs into external work

- **Government-funded research**
 - Sewage sludge (WRc)
 - FYM (ADAS)
 - Applications of ozone (Bristol)
 - Irrigation water (UEA/Surrey etc)
 - Review of hazards, organic waste usage (Harper Adams)
- **Nuffield Scholarship**
 - Water quality & quantity and its impact on food production
- **US FDA-funded research**
 - *E coli* O157 and produce
- **UN FAO/WHO Expert Group Leafy Veg & Herbs**
 - Hazard review
 - CODEX Food Hygiene Committee - code

What makes produce ready to eat?

- **Manufacturer's risk assessment and food design, i.e. HACCP plan**
- **Appropriate field controls**
 - Minimise potential for contamination by zoonotic organisms
 - CFA's Micro Guidance for Growers (2nd ed)
- **Hygienic preparation and packing**
 - Prevent re-/cross-contamination
 - Remove soil
 - CFA Best Practice Guidelines for the Production of Chilled Food (4th ed)
- **Limited shelf life**
 - Ensure peak quality and
 - Minimise opportunity for microbial growth
- **Chilled distribution and sale**
 - Minimise potential for microbial growth

Field controls and audits

- **Crop protocols**
 - Usage of organic waste in agriculture
 - Human-derived (sewage sludge)
 - Animal-derived (farmyard manures, abattoir waste)
 - Irrigation water quality
- **Contracts and audits**
- **Supplier Codes and Guidelines**
 - English, Spanish, French, Italian
 - Detailed audit documentation: full + core food safety
 - **Same technical requirements for all suppliers - UK and Non UK**

Relevant CFA Guidelines

- **Fields**
 - **Microbiological Guidance for Growers**
 - English language (2007, 2002) – support by major UK retailers
 - Spanish (2004)
 - Finnish (2005)
 - **Pesticides Due Diligence (2002)**
- **Factory**
 - 4th ed CFA Best Practice Guidelines for the Production of Chilled Food (2006)
 - Washing protocols (when using chlorine)
- **General**
 - 2nd edition Water Quality Management Guidance (2005)
 - Guidance on the use & interpretation of micro testing (2005)
 - CFA/BRC Guidance on the Practical Implementation of the EU Micro Criteria Regulations (2005)



Waste as an output



Why does waste arise?

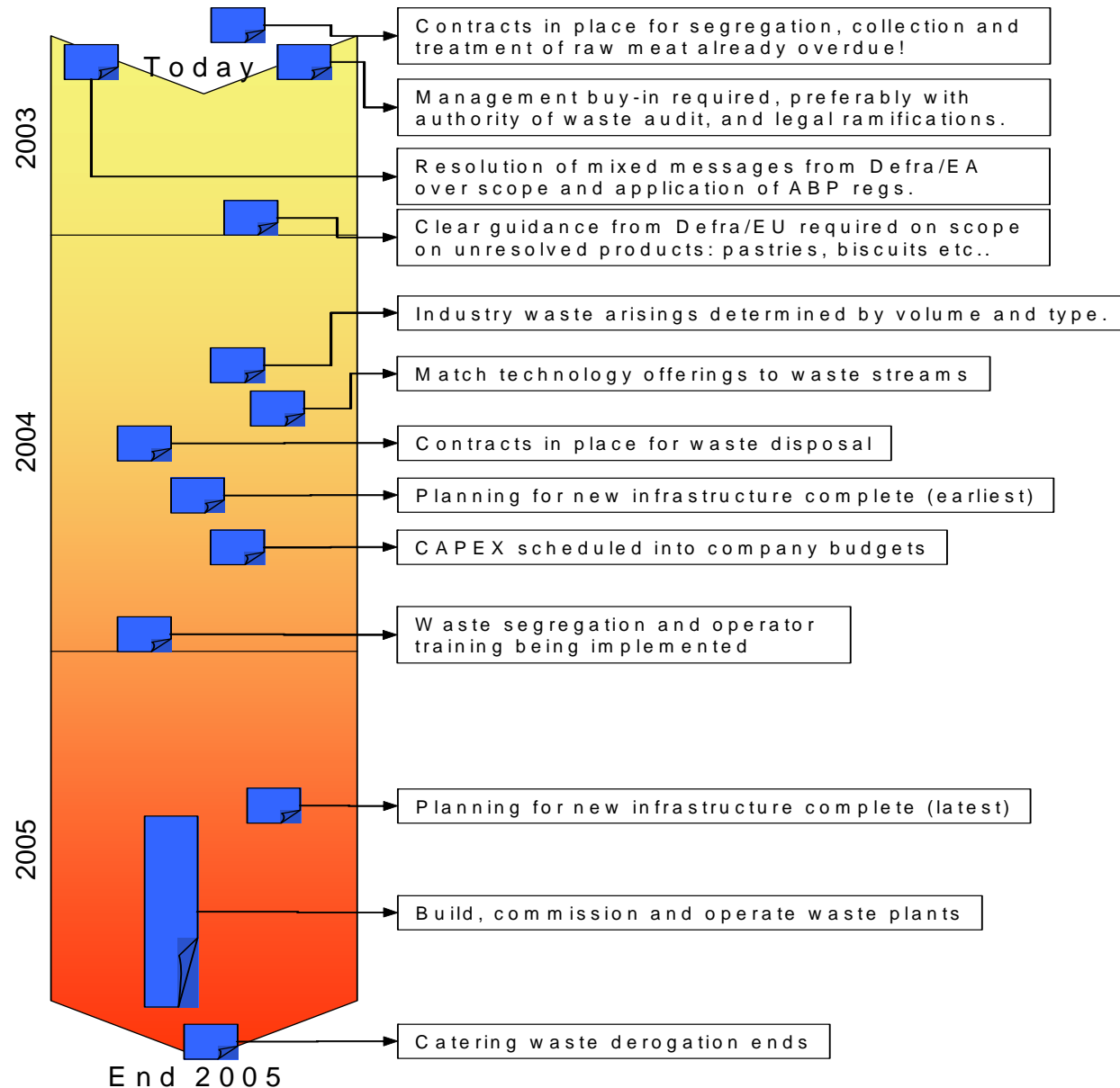
- **Chilled prepared food does not contain waste**
- **PICME 2005-6 Waste Minimisation Study:**
 - Raw material quality rejects
 - Machinery capability = economic constraint
 - Raw material stock disposals
 - Trims
 - Market imposed = commercial constraint
 - Operator handling and processing errors
 - Production line drops/spills
 - Changeovers, clean outs
 - Start-up/shut down scrap

Waste as an output

- **CFA route to solutions:**
 - Obtained **ABPR implementation delay** (June 2003-Jan 2006) to enable disposal infrastructure to be developed
 - **CFA/Defra Workshop Sept 2003** → **Compliance routemap**
 - **CFA/Defra Waste Technologies Workshop May 2004:**
 - CFA chilled food sector waste mapping data: **what + where**
 - Technical solutions options identified: **how**
- **Manufacturers want to remain manufacturers and not become waste disposal companies**

CFA 2003 ABPR Compliance Routemap

Former Foodstuffs Treatment Milestones Timeline



2003-4 CFA Waste Mapping

- **Quantify and locate biodegradable (inc Cat 3) waste produced by the sector**
 - Members
 - Estimates for non-members
- **Assist industry in identifying investment requirements**
 - Appropriate disposal systems, locations
 - Waste minimisation, site benchmarking

2003-4 CFA Waste Mapping Findings

- Biodegradable packaging content range: 0-45%
- Waste composition dependent on foods produced at each site
- **Disposal system location requirements** - hot spots
 - Lincs, Cambs: (43%)
 - East Mids, East: (53%)

	Total daily tonnage food (Cat 3) & biodegrade pack waste	Total Cat 3 food waste
Total Daily Tonnage:	470	426
Total Annual Tonnage:	171,590	155,490

~5% final manufactured volume



Requirements/Challenges

- **Waste outputs**
 - **Minimise waste**
 - **Know waste characteristics**
 - **Identify viable disposal technologies**
 - **Identify [local] solution providers**
 - **Potential liaison with**
 - Other local manufacturers to share solutions (volumes)
 - Local Authorities – piggy backing with local systems
 - **Invest in compliance**
 - **Do it now!**



Requirements/Challenges

- **Waste inputs in agriculture**
 - **Minimise/prevent contamination in/directly from**
 - animal or
 - human waste or
 - other material potentially presenting hazards
 - **Spread best practice on key controls internationally**
 - correct field management (growing) and
 - handling in the supply chain
 - **Obtain overt Defra, FSA, EC, UN support for appropriate GAP applied to all RTE produce inc wholesaled**



Conclusions



- **Waste as an input**
 - Over a decade of CFA proactive work
 - Field controls established = **critical** to assuring safety
 - Best practice guidance in place
 - Research continuing
 - Incident alerts and resolution
 - Network of expertise internationally
 - **Seeking international uptake of standards**
- **Waste as an output**
 - Wide range of carbon impact reduction activity
 - **Disposal/reuse options still required**

Sources of Further Information

- **CFA guidance documentation**
 - www.chilledfood.org/resources/publications.htm
- **Presentations from CFA/Defra Waste Technologies Workshop (May 2004)**
 - www.chilledfood.org/resources/Presentations.htm
- **CFA 2003-4 resource mapping data**
 - By town and county: <http://tinyurl.com/d8ydrm>
 - By town and EA region: <http://tinyurl.com/dbxtzd>



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