Chilled (produce) Supply Chains
For HPA 13/11/06
Crop Groups for Prepared Salads

- Salads
  - Repeat harvested crops
    - Cucumbers
    - Peppers
    - Tomatoes
  - Destructively harvested crops
    - Leaf
      - Drilled crops seed is sown into the soil
        - Spinach
        - Baby Leaf
        - Herbs
        - Brassicas
      - Head crops seeds are raised in a plantraiser
        - Endives
        - Commodities
        - Specialities
The survey covered the primary distribution of food from factories to regional distribution centres (RDCs), either directly or via primary consolidation centres (PCCs), secondary distribution trips from RDCs to shops and tertiary distribution from wholesale depots to independent retailers and catering outlets (Figure 1).

Structure of food distribution channels
# Retail Produce Supply Chains

<table>
<thead>
<tr>
<th>Raw Material Source &amp; Standards</th>
<th>Retail</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Major Multiple</td>
<td>Independent</td>
</tr>
<tr>
<td>Whole: Direct purchase from specified suppliers/dedicated growers with full traceability, Assured Produce etc</td>
<td>Whole: Wholesaled – variable standards and traceability</td>
<td>Whole: Small amount of direct purchase from growers – variable standards</td>
</tr>
<tr>
<td>Prepared: Manufacturers supplied direct by specified suppliers/dedicated growers with full traceability, Assured Produce etc</td>
<td>Prepared: Some manufacturers supplying prepared produce/ products containing produce to major multiples have their own brands supplying independents, with the same standards as for major multiple supply</td>
<td></td>
</tr>
</tbody>
</table>

Yellow highlight = CFA members
## Wholesaled/Publicly Procured Produce

<table>
<thead>
<tr>
<th>Market</th>
<th>Wholesaled</th>
<th>Publicly Procured</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Markets, Cash and Carry</td>
<td>Schools, Hospitals, Prisons etc</td>
</tr>
<tr>
<td></td>
<td>Various sources – variable</td>
<td>See Wholesaled – variable standards and traceability</td>
</tr>
<tr>
<td>Raw Material Source and</td>
<td>standards and traceability</td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>Whole &amp; Prepared: Some manufacturers supplying major multiples have their</td>
<td>Small amount of direct purchase from growers – variable standards</td>
</tr>
<tr>
<td></td>
<td>own brands supplying wholesale, with the same standards as for major</td>
<td></td>
</tr>
<tr>
<td></td>
<td>multiple supply</td>
<td></td>
</tr>
</tbody>
</table>

Yellow highlight = CFA members
# Foodservice Produce Supply Chains

<table>
<thead>
<tr>
<th>Market</th>
<th>Major chains</th>
<th>‘Entrepreneurs’ (e.g. non-chain take aways, cafes, restaurants, some franchises inc petrol &amp; railway stations)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Whole &amp; Prepared: Specified suppliers with full traceability, Assured Produce etc</td>
<td>Majority wholesaled/spot purchased –variable standards and traceability</td>
</tr>
<tr>
<td>Raw Material Source and Standards</td>
<td>Whole &amp; Prepared: Some manufacturers supplying major multiples have their own brands supplying foodservice, with the same standards as for major multiple supply</td>
<td>Whole: Small amount of direct purchase from growers – variable standards</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Whole &amp; Prepared: Some purchased from major multiples</td>
</tr>
</tbody>
</table>

Yellow highlight = CFA members
Salads Raw Material

Supplier Approval Procedures into prepared for major UK retailers
Audit Documentation

• Supplier Code of Practice and Guideline Documents
  – Available in English, Spanish, French, Italian
  – Detailed Audit Documentation
  – Same Technical Requirements for all suppliers - UK and Non UK
CFA Guidelines

- **4th edition CFA Best Practice Guidelines for the Production of Chilled Food (2006)**
- **Microbiological Guidance for Growers**
  - English language version (2002) – supported by major UK multiples
  - Finnish version (EVI) (2005)
- **Pesticides Due Diligence (2002)**
- **Guidance on the use & interpretation of micro testing (2005)**

More than 30,000 copies distributed to date
Supplier Monitoring

• Specified suppliers
• All suppliers are monitored by sites against a range of commercial and technical criteria
  – Field practices
  – Irrigation water control
  – Microbial loading (E. coli)
  – Pesticide residue analysis
  – Contaminant levels
  – Quality criteria
  – etc
Leaf Production

- Cultivation
- Harvesting
- Leaf chilling
- Processing
- Despatch
- Distribution
- Shelf life
Cultivation

• Seed selection and screening
• Harrowing
• Bed forming
• Drilling seeds into the seed bed
• Irrigation
  – Source and quality
  – Method of application
  – Type and end use of crop
Harvesting

- **Hygiene**
  - People
    - Medical screening
    - Hygiene training
  - Equipment
    - Cutting whole head
    - Cutting or scything baby leaf

- **Weather conditions**
  - Minimise impact
Chill Controls

• Remove field heat to minimise micro
  and biochemical activity
  – E.g. chilling to 3°C in under 60 minutes

• We adopt a “keep it cold – move it fast” philosophy
  – E.g. measure degree hours from harvest to customer
Processing

- **Sorting**
  - Remove damaged produce
  - Remove extraneous matter

- **Trimming**
  - Removed damaged tissue

- **Manual inspection**

- **Mixing leaves**

- **Washing**

- **Bagging**
Post-Process Chain

• Despatch and distribution to retail
  • <5°C

• Retail storage
  • <8°C legally

• Consumer storage

• Shelf life (bagged salads)
  • UK: 4-7 days
  • USA: 18-21 days
CFA Produce WG

• Growing controls
  – Industry guidance
    • CFA Micro Guidance for Growers → Assured Produce
    • ADAS Safe Sludge Matrix (still awaiting UK law)
    • Retailers’ protocols
    • 1999 ECFF VTEC WG Report → presented to EC SCF
      2000 → 2001 EC SCF produce risk assessment
  – Input into FSA guidance
    • Sprouted seeds production control measures
    • Farmyard manure guidance for growers
  – Research – proactive and reactive
CFA-funded Research

- CFA/DEFRA/IFR pathogen attachment research
  - Commercial driver = safety (expanding markets)
  - Industry commitment
  - Potential exploitation
  - Business benefits
    - Chlorine usage reduction & environmental benefits & potential perceived consumer benefits
    - Reducing costly waste
  - Sound scientific approach
  - Timetable
Our Positive Impact

• Volumes of bagged leafy salads (1990+)
  – UK: $2.6 \times 10^9$ packs
  – Worldwide: $1.8 \times 10^{10}$ packs

+ other presentations of prepared produce

• Potentially prep leaf-related VTEC incidents
  – USA  26 outbreaks (>900 cases) (lettuce + spinach) since 1993
  – Europe 2 outbreaks (>200 cases) (wholehead, Sweden)
  – UK  0 outbreaks
Leaf Sales Summer 2006

• From RETAIL sales 28/5-4/8/06 (8 wks)
  – Bagged leaf 60M packs = 180M servings
  – Wholehead 55M units = 265M servings

• 3 week period (average)
  – Bagged: 24M bags, 70M servings
  – Wholehead: 20M units = 100M servings
  – TOTAL RETAILED: 48M units = 170M servings
  – FOODSERVICE: est 1/3 of retail vol: 35M servings

• GRAND TOTAL ave 3 wk: 205M servings
  – ~50:50 Retail:Wholesale (servings)
Conclusions

• Over a decade of CFA proactive work
  – Field controls established = critical to assuring safety
  – Best practice guidance in place
  – Attachment research underway
  – Incident alerts and resolution
  – Network of expertise internationally

• CFA’s strong industry ties - authoritative

• Government linkage - accessible
  – FSA
  – DEFRA
  – HPA
  – PSD
The centre of excellence for the chilled food industry