The Arab-GAP: scope and framework

Expert Group Meeting on the Scope and Setting up of an Arab – Good Agricultural Practices (Arab – GAP) Framework

Dima Faour-Klingbeil, MSc, MIFST
Food Safety and Quality management Expert
WHY Fresh Produce?

GLOBAL HEALTH CONCERNS

Fresh produce is responsible for half of the foodborne illnesses in the USA (CSPI, 2015)
"It is generally safer to eat a burger than the salad that goes with it” (Telegraph, 22/03/2013)
Fresh Produce: Potentially hazardous food

- Populations are being encouraged to consume more fresh vegetables and fruits.
- Increasing production of ready to eat produce.
- Complete elimination of organisms is not possibly achieved by conventional methods.
Fresh Produce: Potentially hazardous food

- Short-life and perishability

- Limited information

- Critical shortfalls at harvest and post-harvest stages along the food chain pose great health risks (AFED, 2014; Faour-Klingbeil et al., 2016).
Fresh Produce: Potentially hazardous food

2004-2012:

197 outbreaks in EU and 377 in the USA
<table>
<thead>
<tr>
<th>Location</th>
<th>Year</th>
<th>Pathogen</th>
<th>Produce</th>
<th>Cases (deaths)</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>2005</td>
<td>Salmonella</td>
<td>Mung bean sprouts</td>
<td>592</td>
<td>Rohekar et al., 2008</td>
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<tr>
<td>USA</td>
<td>2005</td>
<td>Salmonella</td>
<td>Tomatoes</td>
<td>459</td>
<td>CDC, 2007</td>
</tr>
<tr>
<td>USA</td>
<td>2006</td>
<td>E. coli O157:H7</td>
<td>Spinach</td>
<td>199 (3)</td>
<td>CDC, 2006b</td>
</tr>
<tr>
<td>Australia</td>
<td>2006</td>
<td>Salmonella</td>
<td>Alfalfa sprouts</td>
<td>125</td>
<td>Compton et al., 2008</td>
</tr>
<tr>
<td>USA, Canada</td>
<td>2006</td>
<td>Salmonella</td>
<td>Fruit salad</td>
<td>41</td>
<td>Landry et al., 2007</td>
</tr>
<tr>
<td>USA</td>
<td>2006</td>
<td>Salmonella</td>
<td>Tomatoes</td>
<td>183</td>
<td>CDC, 2006a</td>
</tr>
<tr>
<td>USA</td>
<td>2006</td>
<td>E. coli O157:H7</td>
<td>Lettuce</td>
<td>81</td>
<td>FDA, 2007</td>
</tr>
<tr>
<td>Australia</td>
<td>2006</td>
<td>Salmonella</td>
<td>Cantaloupe</td>
<td>115</td>
<td>Munnoch et al., 2008</td>
</tr>
<tr>
<td>USA</td>
<td>2006</td>
<td>E. coli O157:H7</td>
<td>Spinach</td>
<td>22</td>
<td>Grant et al., 2006</td>
</tr>
<tr>
<td>Europe</td>
<td>2007</td>
<td>Salmonella</td>
<td>Baby spinach</td>
<td>354</td>
<td>Denny et al., 2007</td>
</tr>
<tr>
<td>North America, Europe</td>
<td>2007</td>
<td>Salmonella</td>
<td>Basil</td>
<td>51</td>
<td>Pezzoli et al., 2007</td>
</tr>
<tr>
<td>Australia, Europe</td>
<td>2007</td>
<td>Shigella sonnei</td>
<td>Baby carrots</td>
<td>230</td>
<td>Lewis et al., 2007</td>
</tr>
<tr>
<td>Europe</td>
<td>2007</td>
<td>Salmonella</td>
<td>Alfalfa sprouts</td>
<td>45</td>
<td>Emberland et al., 2007</td>
</tr>
<tr>
<td>USA, Canada</td>
<td>2008</td>
<td>Salmonella</td>
<td>Peppers</td>
<td>1442 (2)</td>
<td>CDC, 2008b; Mody et al., 2011</td>
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<tr>
<td>USA, Canada</td>
<td>2008</td>
<td>E. coli O157:H7</td>
<td>Lettuce</td>
<td>134</td>
<td>Warriner and Namvar, 2010</td>
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<tr>
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<td>2008</td>
<td>Salmonella</td>
<td>Basil</td>
<td>32</td>
<td>Elviss et al., 2009</td>
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<tr>
<td>USA</td>
<td>2008</td>
<td>Salmonella</td>
<td>Cantaloupe</td>
<td>51</td>
<td>CDC, 2008a</td>
</tr>
<tr>
<td>USA, Canada</td>
<td>2008</td>
<td>Salmonella</td>
<td>Peanut butter</td>
<td>714 (9)</td>
<td>CDC, 2009b</td>
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<tr>
<td>USA</td>
<td>2009</td>
<td>Salmonella</td>
<td>Alfalfa sprouts</td>
<td>235</td>
<td>CDC, 2009a</td>
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<tr>
<td>USA</td>
<td>2010</td>
<td>E. coli O145</td>
<td>Lettuce</td>
<td>26</td>
<td>CDC, 2010a</td>
</tr>
<tr>
<td>USA</td>
<td>2010</td>
<td>Salmonella</td>
<td>Alfalfa sprouts</td>
<td>44</td>
<td>CDC, 2010b</td>
</tr>
<tr>
<td>USA</td>
<td>2010</td>
<td>L. monocytogenes</td>
<td>Fresh cut produce (celery)</td>
<td>10 (5)</td>
<td>FDA, 2010</td>
</tr>
<tr>
<td>USA</td>
<td>2011</td>
<td>Salmonella</td>
<td>Alfalfa and mixed sprouts</td>
<td>140</td>
<td>CDC, 2011b</td>
</tr>
<tr>
<td>USA</td>
<td>2011</td>
<td>Salmonella</td>
<td>Cantaloupe</td>
<td>20</td>
<td>CDC, 2011c</td>
</tr>
<tr>
<td>USA</td>
<td>2011</td>
<td>Salmonella</td>
<td>Papaya</td>
<td>106</td>
<td>CDC, 2011d</td>
</tr>
<tr>
<td>Europe</td>
<td>2011</td>
<td>E. coli O104:H4</td>
<td>Vegetable sprouts</td>
<td>3911 (47)</td>
<td>ECDC, 2011; EFSA, 2011</td>
</tr>
<tr>
<td>USA</td>
<td>2011</td>
<td>L. monocytogenes</td>
<td>Cantaloupe</td>
<td>146 (31)</td>
<td>CDC, 2011e</td>
</tr>
<tr>
<td>USA</td>
<td>2011</td>
<td>E. coli O157:H7</td>
<td>Strawberries</td>
<td>15 (1)</td>
<td>FDA, 2011</td>
</tr>
<tr>
<td>USA</td>
<td>2011</td>
<td>E. coli O157:H7</td>
<td>Lettuce</td>
<td>60</td>
<td>CDC, 2011a</td>
</tr>
</tbody>
</table>
Panic in Germany

- Largest HUS/EHEC outbreak in history
- Mainly young adults, female > male
- Death count raises daily
- Source still unknown
- Sales for salads and vegetables plummeting

HUS Incidence
(cases per 100,000 persons)

Prof. Alexander Kekulé - Director - Institute for Biosecurity Research, Germany
Food-borne Epidemic in the EU: Desperately Seeking the Source

- Unconnected cluster in Bordeaux
- EFSA, July 5: It's Fenugreek seeds from Egypt!
- But the bug was never detected in seeds or sprouts
  ⇒ It can happen again, any time

Cases (deaths) May 1 – July 4

Prof. Alexander Kekulé - Director - Institute for Biosecurity Research, Germany
<table>
<thead>
<tr>
<th>Recent fresh produce-related outbreaks</th>
<th>Type of produce/Origin</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2015:</strong> Salmonella Poona outbreak, 767 people infected from 36 states</td>
<td>Cucumbers from Mexico</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>2014:</strong> Salmonella Newport outbreak sickened 257 patients in 29 states and the District of Columbia. Source. CSPI 2015</td>
<td>Cucumbers / unidentified source</td>
<td>The bacteria was assumed to be linked to the application of manure.</td>
</tr>
<tr>
<td><strong>2012:</strong> Salmonella Typhimurium and Salmonella Newport in 2012, sickened 261 people in 24 states, 3 deaths and 94 hospitalizations. Source. CSPI 2015</td>
<td>Cantaloupe</td>
<td>An inspection found unsanitary conditions in the farm’s processing shed.</td>
</tr>
<tr>
<td><strong>2008:</strong> Salmonella SaintPaul sickened 1,442 people in 43 states. Source. CSPI 2015</td>
<td>Jalapeño and serrano peppers and pepper products (e.g., salsa)/ Mexico</td>
<td>Suspected caused contaminated irrigation water</td>
</tr>
</tbody>
</table>
THE SHIFT IN FOOD SAFETY

Food safety and quality control
Food Safety and quality assurance
Risk Management

Hazard Analysis
Risk Assessment

Hazard: a threat that causes harm
Risk: likelihood a person is harmed by the hazard
<table>
<thead>
<tr>
<th>Year</th>
<th>Initiative</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990’s</td>
<td>Assured produce</td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>Tesco Natures choice</td>
<td>Red Tractor Fresh produce, Systems, HACCP principles, Risk assessment source of microbial contamination, water testing for E.coli</td>
</tr>
<tr>
<td>1997</td>
<td>EurepGA P</td>
<td>Tesco Natures, Water testing, Critical values for E.coli in water and indicators in composts, guidance on RA methodology, Metrics for water sources</td>
</tr>
<tr>
<td>2004</td>
<td>M&amp;S Field to Fork</td>
<td>M&amp;S Field to Fork version 2, ARAB G.A.P ??, Systems, HACCP principles, Risk assessment source of microbial contamination</td>
</tr>
</tbody>
</table>
Growing demands for safe produce

Total number of GLOBALG.A.P certified producers worldwide from 2005 to 2012*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of certified producers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>35,000</td>
</tr>
<tr>
<td>2006</td>
<td>57,000</td>
</tr>
<tr>
<td>2007</td>
<td>81,000</td>
</tr>
<tr>
<td>2008</td>
<td>94,000</td>
</tr>
<tr>
<td>2009</td>
<td>99,500</td>
</tr>
<tr>
<td>2010</td>
<td>102,300</td>
</tr>
<tr>
<td>2011</td>
<td>112,600</td>
</tr>
<tr>
<td>2012</td>
<td>123,115</td>
</tr>
</tbody>
</table>

Source: GLOBALG.A.P, © Statista 2015

Additional Information: Worldwide, incl. farms certified through other recognized organizations
Audit process flow:

- All Farms Base
- Aquaculture Base V2009 AB(2009)
- Crops Base
- Livestock Base

Scopes:
- Fruit and Vegetables (FV)
- Combinable Crops (CC)
- Coffee (Green) (CO)
- Tea (TE)
- Flowers and Ornamentals (FO)
- Cattle & Sheep (CS)
- Dairy (DY)
- Pigs (PG)
- Poultry (PY)
- Turkey (TY)
- Salmonids (SN)
- Shrimp (SP)
- Pangasius (PN)
- Tilapia (TA)

Livestock Sub-scopes:
- Dairy (DY)
- Pigs (PG)
- Poultry (PY)
- Turkey (TY)

Crops Sub-scopes:
- Fruit and Vegetables (FV)
- Combinable Crops (CC)
- Coffee (Green) (CO)
- Tea (TE)
- Flowers and Ornamentals (FO)

Aquaculture Sub-scopes:
- Salmonids (SN)
- Shrimp (SP)
- Pangasius (PN)
- Tilapia (TA)
دليل الممارسات الزراعية الجيدة
في الوطن العربي

الخرطوم - جمهورية السودان
ديسمبر (كانون أول) 2007
The AOAD project in 2007 put emphasis on the dissemination of good agricultural practices (GAP) in the Arab countries though the development of Arab GAP guide.
Arab GAP GUIDE: 2nd Part

Arab GAP standard

General regulations  Critical Points for compliance Control  Interpretation guidelines
Arab GAP FOUNDATION

General regulations

CCPC

Global GAP

Certification process

Certification classification and parties
General Regulations (GR) (how the certification process works)
Control points and compliance criteria (CPCC),
Inspection documents referred to as Checklists (CL),
National GAP requirements referred to as Approved National Interpretation Guidelines and harmonization tools referred to as Benchmarking Cross Reference Checklist (BMCL) and other guidelines.
<table>
<thead>
<tr>
<th>No.</th>
<th>Section name</th>
<th>Major Musts</th>
<th>Minor Musts</th>
<th>Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Traceability</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Record keeping and internal self-inspection</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Varieties and rootstocks</td>
<td>1</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Site history and site management</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Soil and substrate management</td>
<td>1</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>Fertiliser use</td>
<td>2</td>
<td>15</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Irrigation / fertigation</td>
<td>1</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>Crop protection</td>
<td>15</td>
<td>43</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Harvesting</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>Produce handling</td>
<td>13</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Waste and pollution management, recycling and re-use</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>Worker health, safety and welfare</td>
<td>2</td>
<td>13</td>
<td>9</td>
</tr>
<tr>
<td>13</td>
<td>Environmental issues</td>
<td></td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>14</td>
<td>Complaint form</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td>49</td>
<td>99</td>
<td>66</td>
</tr>
</tbody>
</table>
GENERAL REGULATIONS

- Certification bodies (Audits, certification issuing)

- Parties that can apply:
  - Individual farmer/producer
  - Group producers

Trademark : ARABGAP
INSTRUCTIONS

- CPCC
- Interpretative guidelines
- Other documents: supportive for applications of the standard, annexed guides (Global GAP)
CERTIFICATION OPTIONS

**Individual**

- Internal inspection - at least annually
- External unannounced audits - at least annually
- External unannounced audits (10% of registered participants)

**Group producer**

- Centrally operating Quality system and internal audits for each individual producer - at least annually
- Traceability (certified vs uncertified products)
- External audits (random selection of farms in the producer groups)
COMPLIANCE LEVELS

- Must rules: Critical and mandatory
  - Major Musts: 100% compliance is compulsory.
  - Minor Musts: 95% compliance to this category should be maintained.
- Recommendations: No minimum percentage of compliance is set.
RIGHTS OF APPLICANTS

- Notifications (14 days) after application submission
- Certification issuing 28 days after auditing or compliance verification
- Complaints and claims
- Right to select and change CB
NON-COMPLIANCE

- Warning: Cease in case of incomplete correction (max 28 days)

- Ceasing: in case of export to EU. Banning use of the trademark and certification for a specified period of time (max. 6 months).

- Cancellation. Resubmission in 12 months
Regional Framework

“Promoting Food and Water Security through Cooperation and Capacity Development in the Arab Region”
Purpose

- Assurance of safety and quality of fruits and vegetables for consumers
- Harmonize national GAP schemes and approaches within the Arab region
- Enhance the sustainability of the environment, social and health welfare of workers.
Implementation

6.1 • Development of regional mechanism/body/agency for ArabG.A.P implementation
• Development of the certification program
• Mechanism for management of regional certification process

6.2 • Agreement annexed control points and interpretation guidelines
• Finalization of ArabG.A.P codes, regulations
• Alignment of national standards with ArabG.A.P
• Network of national representatives and certification bodies

6.3 • Development of training modules and dissemination of the standard at national and regional level

6.4 • Future plan for benchmarking with GLOBALG.A.P and global recognition
Stage 1: Official and legal of the Arab GAP body / commission
Stage 1: Official and legal entity: Arab GAP body/commission

- Management Board
- Secretariat
- CBC
  Evaluation, Monitoring & Approval of Certification Bodies
  - Approved CBs for Arab GAP Certification
  - Certification of producers
- STC
  Technical & Scientific Advice & Support
  - Standards, Updates, Technical Modifications & Revisions, Benchmarking Process

Experts: Industry, academic and scientific fields, government officials

Regional partners
Stage 2: REVIEW SCHEME REQUIREMENTS

- Food safety
- Environmental sustainability/biodiversity
- Food traceability
- Worker operational health and safety
- Includes Produce Handling, Integrated Crop Management (ICM), Integrated Pest Control (IPC), Quality Management System (QMS), and Hazard Analysis and Critical Control Points (HACCP)
Farm management and operation
- Site history and management
- Record keeping and internal inspection
- Subcontractor
- Traceability and sale management
- Complaint management and recall

Food Safety
- Management of soil, water and propagation materials
- Fertilizers management
- Plant protection product
- Hygiene
- Sanitary facilities
- Packing and storage area
- Quality control
- Rodent and bird control

Workers' safety and welfare
- Risk assessment of workers conditions
- Training
- Workers' welfare

Sustainable agriculture environment
- Water conservation
- Waste and pollution management, recycling and re-use
- Disposal of Surplus Application Mix
- Environment and conservation
- Energy efficiency
Stage 3: Certification body

- the Department of Agriculture or a private certification body responsible for various certifications of GFSI (Global Food Safety Initiative) approved standards

- CB is an independent entity
SELECTION OF CB

- Certification scope – the produce that the farmer or farmer group require to get certified should be within the scope of the certification body which is recognized by an accreditation body.
- Competence and experience of auditors in the scope.
- Cost effectiveness.
Stage 4: TRANSITIONAL COMPLIANCE

3rd Class Arab GAP
- 100% M of FS module
- 70% M of rest
- 50% m

2nd Class Arab GAP
- 100%M
- 70% m

1st Class Arab GAP
- 100% M
- 95% m

Time frame
- Market driven
- Incentives
- Actual regional experiences
Stage 5: ENDORSEMENT

Stakeholders
Dissemination of the requirements and certification process shall be promoted through workshop series
- Ministry of agriculture
- Food control department
- Civic societies
- Locally active certification bodies
- Retailers

Benchmarking process
the requirements are relevant and achievable for all member countries and the extent of alignment of existing national standards with the practices in the ARAB GAP modules
## Current alignment of national GAP Programs with ASEAN GAP

<table>
<thead>
<tr>
<th>Country</th>
<th>Food safety</th>
<th>Environmental Management</th>
<th>Worker’s health and safety</th>
<th>Produce quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thailand</td>
<td>C</td>
<td>P</td>
<td>P</td>
<td>C</td>
</tr>
<tr>
<td>Malaysia</td>
<td>C</td>
<td>P</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>Indonesia</td>
<td>C</td>
<td>C</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Singapore</td>
<td>C</td>
<td>N</td>
<td>N</td>
<td>S</td>
</tr>
<tr>
<td>Philippines</td>
<td>C</td>
<td>N</td>
<td>P</td>
<td>S</td>
</tr>
<tr>
<td>Brunei Darussalam</td>
<td>C</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>

**T = Total alignment**  
**C = close alignment**  
**P = partial alignment**  
**N = no alignment**  
**S = covered by another national standard**

Table 2. National GAP programs benchmarked to the ASEAN GAP (UNEC, 2016)
Stage 6: IMPLEMENTATION:
MICRO LEVEL
Producers: functions

- Identify hazards
- Decide on the threat properties (who, what, how)
- Evaluate risks and control measures
- Record outcomes, implement them
- Review assessment and update when necessary
Training workshop

A. Promotional workshops – Linkages with retailers
B. Training agricultural advisor and auditors
C. Training of farmers
D. Regional theoretical and on-field training for farmers
Practical training

- 10 farmers from each of the Arab countries will be selected for 5 days ‘training on the Arab GAP concept and implementation requirements (10 -20 candidates /workshop on biannual basis) (e.g., in Morocco or Jordan)

- At the following stage, 30 leading crops producers will be invited for the implementation of the Arab GAP on their farms on annual basis for 3 years, 10 to be selected every year and trained by local trained consultants under the supervision of international consultants.

- The workshops will be combined with field visits to GAP certified producers – individual and group –shall convey the practical implementation of the standard and an overview and understanding of the documentation required to cover the procedures (including SOPs/checklists) and records keeping. The expected program duration is 5 days (one day for each module) combined with field visits to certified farms.
PROMOTION

- communication network and database of local food control authorities and agriculture departments, retailers, producers for promoting the Arab GAP concept and objectives, incentives and benefits for retailers and farmers.
Additional feedback ?