



Traceability and Commodity Demand
Where are we coming from?
Where are we now?
Where are we going?

Mechel S. Paggi
Director, Center for Agricultural Business
California State University, Fresno

Background

- Public Perception and Realities
- The Landscape of the Food Industry
- Global Production and Vertical food Chains
- Current International Tracing Initiatives

Technology and Cost Factors

- Review of current technology
- How does traceability impact industry operating cost

**Policy Environment : Role of State, National, Foreign,
Governments and International Governmental
Organizations**

US Federal (FDA voluntary guidelines, USDA animal ID)
Europe (Private Sector Initiatives)
Homeland Security Initiatives
Private Firms
Industry Coalitions

Foodborne Illness Raises Consumer Awareness & Creates Business Concerns

Some Cases that Got Our Attention

- 1996: Escherichia coli O157:H7 California lettuce
- 1996: Cyclospora parasite in Guatemalan raspberries (originally reported as originating in California strawberries by the Texas Department of Health) The California Strawberry Commission estimated that this false alarm led to \$16 million in lost revenue to growers in the central coast of California
- 1997: Hepatitis A in Mexican Strawberries
- 2000, 2001, 2002: Salmonella, Mexican cantaloupes
- 2003: Hepatitis A in Mexican Green Onions

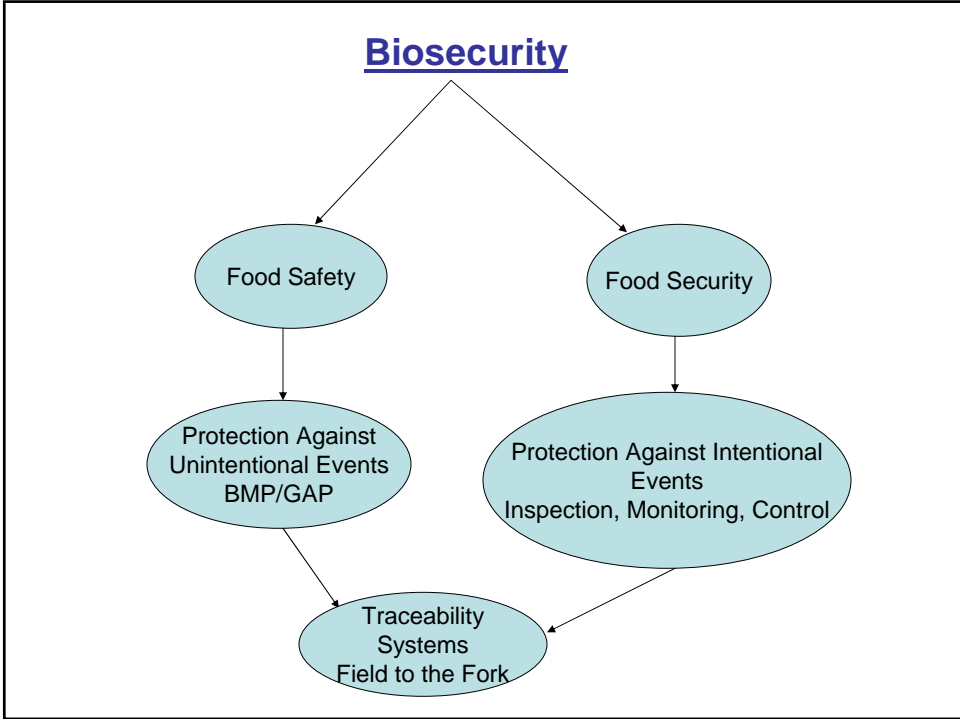
Common food vehicles for pathogens	
Pathogen	Food sources
<i>Campylobacter jejuni</i> <i>or coli</i>	Major: poultry. Minor: milk, mushrooms, clams, hamburger, water, cheese, pork, shellfish, eggs, cake icing.
<i>Clostridium perfringens</i>	Major: meat, meat stews, meat pies, and beef, turkey, and chicken gravies. Minor: beans, seafood.
<i>Escherichia coli</i> O157:H7	Major: beef particularly ground beef. Minor: raw milk, vegetables, cantaloupe, hot dogs, mayonnaise, salad bar items.
<i>Listeria monocytogenes</i>	Major: soft cheese, pâté, ground meat. Minor: poultry, dairy products, hot dogs, potato salad, chicken, seafood, vegetables.
<i>Salmonella</i> (non-typhoid)	Major: poultry, meat, eggs, milk, and their products. Minor: vegetables, fruits, chocolate, peanuts, shellfish.
<i>Staphylococcus aureus</i>	Major: workers handling foods; meat (especially sliced meat) poultry, fish, canned mushrooms. Minor: dairy products, prepared salad dressing, ham, salami, bakery items, custards, cheese.
<i>Vibrio</i> sp.	Major: oysters. Minor: other seafood.
Pathogens causing outbreaks and the foods associated with them are reported by CDC. For more information see: Surveillance for Foodborne Disease Outbreaks --United States, 1993-1997 Vol. 49, No SS01.1 03/17/2000	

Estimated annual costs due to selected foodborne pathogens, 2000 ¹				
Pathogen	Estimated annual foodborne illnesses ²			Costs ^{3,4}
	Cases	Hospitalizations	Deaths	
	Number			Billion 2000 dollars
<i>Campylobacter</i> spp	1,963,141	10,539	99	1.2
<i>Salmonella</i> ⁵	1,341,873	15,608	553	2.4
<i>E. coli</i> O157	62,458	1,843	52	0.7
<i>E. coli</i> , non-O157 ST	31,229	921	26	0.3
<i>Listeria monocytogenes</i>	2,493	2,298	499	2.3
Total	3,401,194	31,209	1,229	6.9

Mantra of Homeland Security

At Any Given Time
60% of the World's Population
Is Awake

And Some of Them
Are Up to No Good



**New Products, In New Packages
In New Places**






Expenditures on Food Away From Home








Year	% of Food Purchases
1976	38 %
1986	43 %
1996	46 %
2006	51 %?

* Ken McCorkle

Source: USDA/ERS

Concentration in GLOBAL FOOD RETAILERS

Grocery Sales Company	Sales (\$ billion)	Net Grocery Sales (\$ billion)	Net Rank
 <i>U.S.</i>	244.52	83.14	1
<i>Carrefour/Promodès France</i>	64.77	45.34	3
 <i>Holland</i>	59.27	49.78	2
 <i>U.S.</i>	51.76	43.48	4
 <i>Germany/Switz.</i>	48.56	24.28	11
<i>Target U.S.</i>	43.92	7.47	27
 <i>U.K.</i>	39.52	28.46	8
<i>Costco U.S.</i>	37.99	23.18	12

Source: R.Cook, 2002

Increasing Adoption of Retail Distribution

Table 4-1—Supermarket share in national food retail (Latin America)

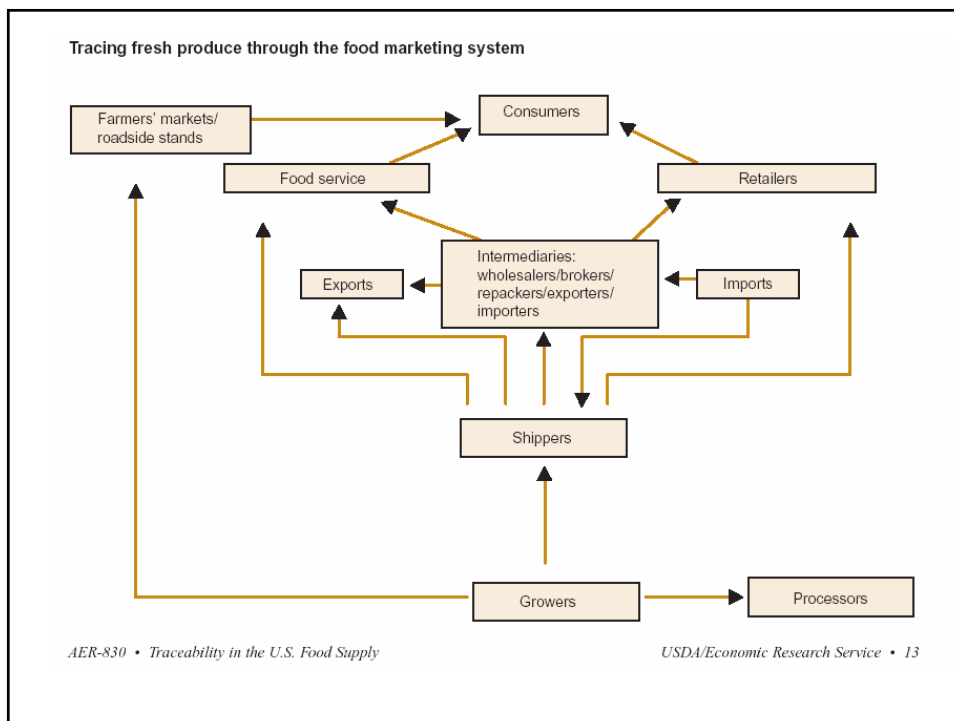
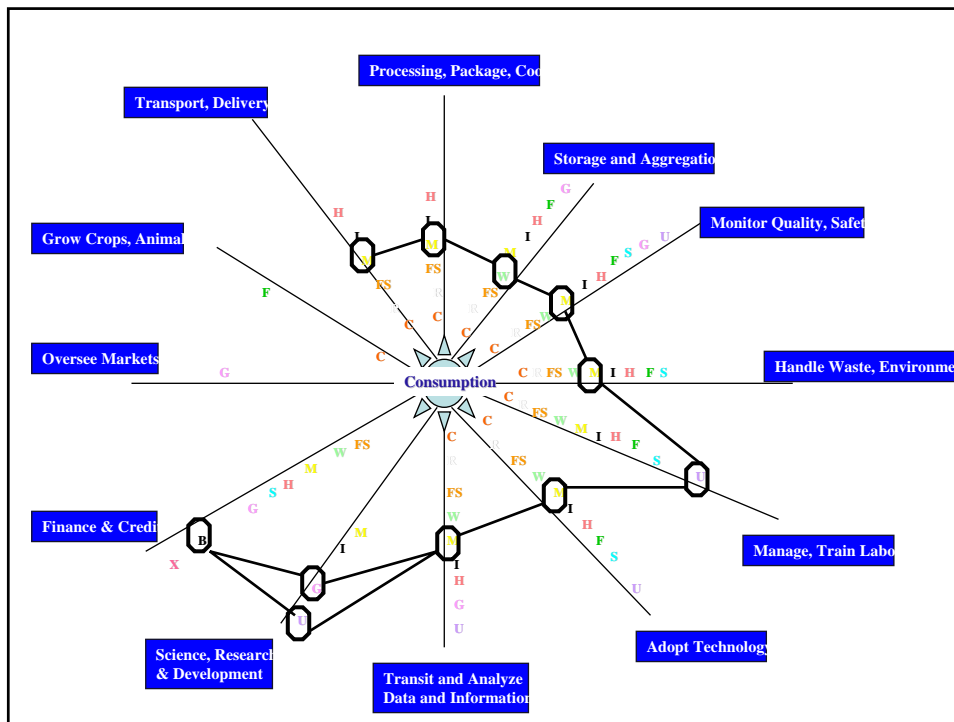
Country	Supermarket share in national retail	
	Past	2001
	<i>Percent</i>	
Argentina	17 in 1985	57
Brazil	30 in 1990	75
Chile	NA	50
Colombia	NA	38
Costa Rica	NA	50
Guatemala	15 in 1994	35
Mexico	NA	45
United States	5-10 in 1930	80 in 2000

Note. NA = not available.

Source: Reardon, T., and J.A. Berdegue, 2002.

Country	Supermarket share in national retail	
	1999	2001
	<i>Percent</i>	
China (urban)	30	48
Indonesia	20	25
Korea	61	65
Malaysia	27	31
Philippines	52	57
Taiwan	65	69
Thailand	35	43

Source: Hu et al., 2005.



Networks Give Rise to Concerns

What happens to the merchandise during transportation by truck, container, rail, or boat?

During transportation a number of events can create both economical and health hazards:

- 1. Pilferage**
- 2. Sabotage / Terrorism**
- 3. Change in temperature**



Other sources of concern:

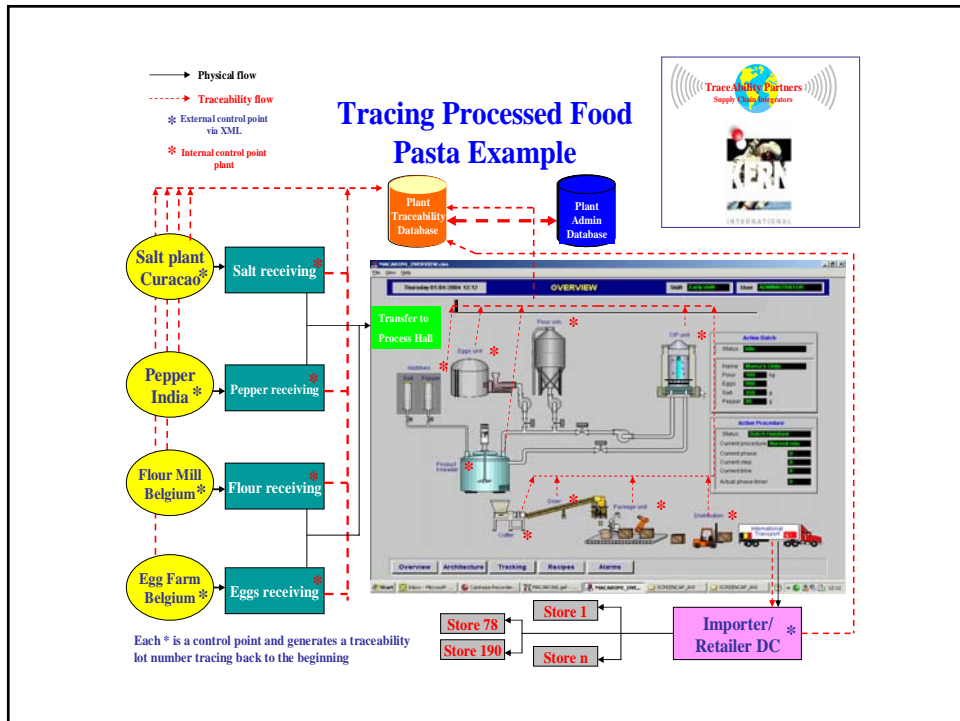
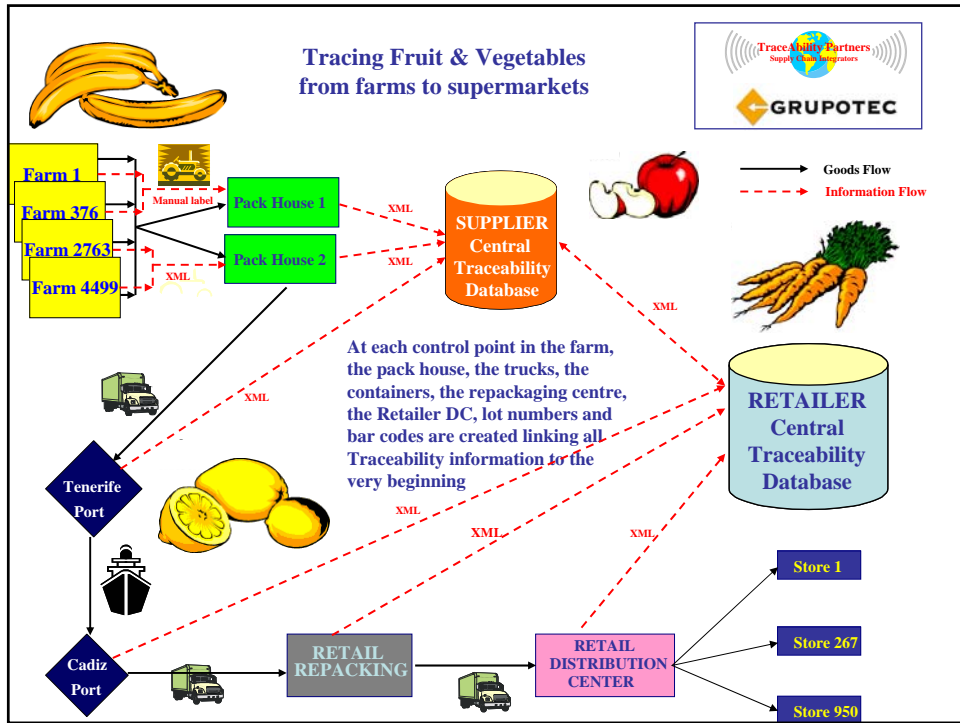
Modern satellite systems allow transport companies to see where trucks, containers and boats are, what is their speed, the inside temperature and changes in temperature etc.

Based on set parameters instant alerts can be given on a variety of events, such as (but not limited to):

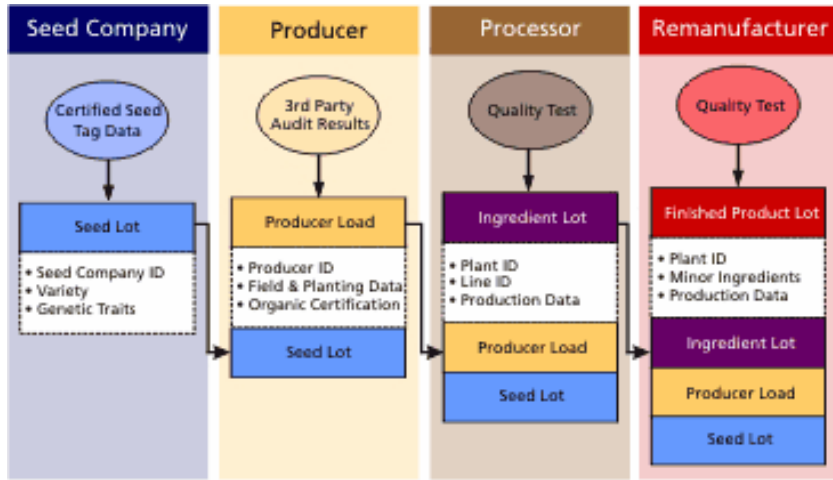
- truck unscheduled stops / starts**
- tethering / un - tethering trailer**
- unacceptable change in temperature**
 - trailer / container opened**
- foreign gasses in trailer / container**

It is anticipated that worldwide systems will be available by early 2005



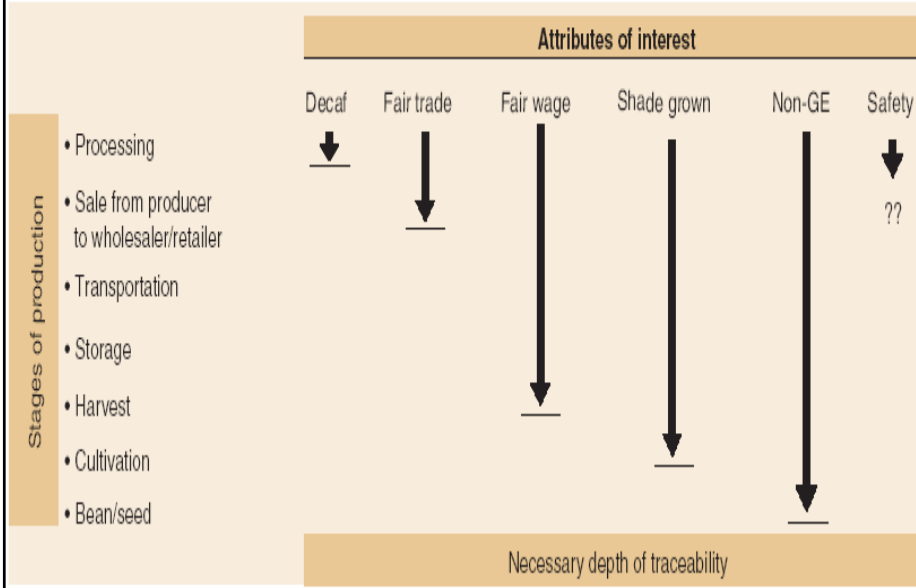


Vegetable Information Traceability Components



Source: John Deere Food Origins

The depth of a traceability system depends on the attributes of interest



**Is Food Safety As an Attribute with Value
Consistent in an Increasingly Global Food System**

**Salinas Valley Lettuce Harvest
Traceability in Practice**



Chinese Carrot Harvest



Salinas Valley Lettuce Harvest



Salinas Valley Lettuce Harvest



Salinas Valley Lettuce Harvest
PACA + Compliance



International Government and Private Initiatives

EU, Requires traceability for all businesses in the food chain
From January 1005.

US record keeping requirements by December 2005 or 2006
Depending on the size of business. (Bioterrorism Act Sec. 306)

Japan traceability on beef obligatory as of December 2004
Coming to other agricultural products

Global Food Safety Initiative

CIES - The Food Business Forum is the only independent global food business network. It serves the **CEOs and senior management** of 175 retailer and 175 supplier member companies, and their subsidiaries, in over 150 countries.

GFSI aims to :

- implement a scheme to benchmark food safety standards (for private label products) world-wide
- facilitate mutual recognition between standard owners and
- ensure world-wide integrity in the quality and the accreditation of food safety auditors.

A simple set of rules of standards, harmony between countries, save money for suppliers.

WHAT IS EUREP

EUREP (*Euro-Retailer Produce Working Group*) sets out a framework for developing **Good Agricultural Practices (GAP)** globally for horticultural products (e.g. fruits, vegetables, potatoes, salads, cut flowers and nursery stock).

The EUREP framework outlines the minimum standard / framework acceptable to the leading retailers in Europe, and is based on **Integrated Crop Management (ICM)**. This is a philosophy that recognises the need for crop production to be economically and environmentally sustainable. It is anticipated that this framework will lead to **“in-country”** product assurance.

7. COMPLIANCE LEVELS FOR EUREPGAP CERTIFICATION

7.1 Compliance with EUREPGAP *Fruit and Vegetables* consists of three types of control points, that the applicant is required to undertake in order to obtain EUREPGAP recognition; *MAJOR MUSTS*, *MINOR MUSTS* and *RECOMMENDATIONS*, and must be fulfilled as follows. (See also chapters 11 & 12 of this document, Sanctions and Non-compliances)

7.1.1 MAJOR MUSTS:

100% compliance of all Applicable Major Must Control Points is compulsory.

7.1.2 MINOR MUSTS:

95% compliance of all applicable Minor Must Control Points is compulsory. For the sake of calculation, the following formula will apply.

$$\left\{ \begin{array}{l} \text{(Total number of} \\ \text{Minor Must} \\ \text{Control Points)} \end{array} - \begin{array}{l} \text{(Not Applicable} \\ \text{Minor Musts Control} \\ \text{Points} \\ \text{Scored on the farm)} \end{array} \right\} \times 5\% = \begin{array}{l} \text{(Total Minor Must} \\ \text{Control Point Non} \\ \text{compliance} \\ \text{allowable)} \end{array}$$

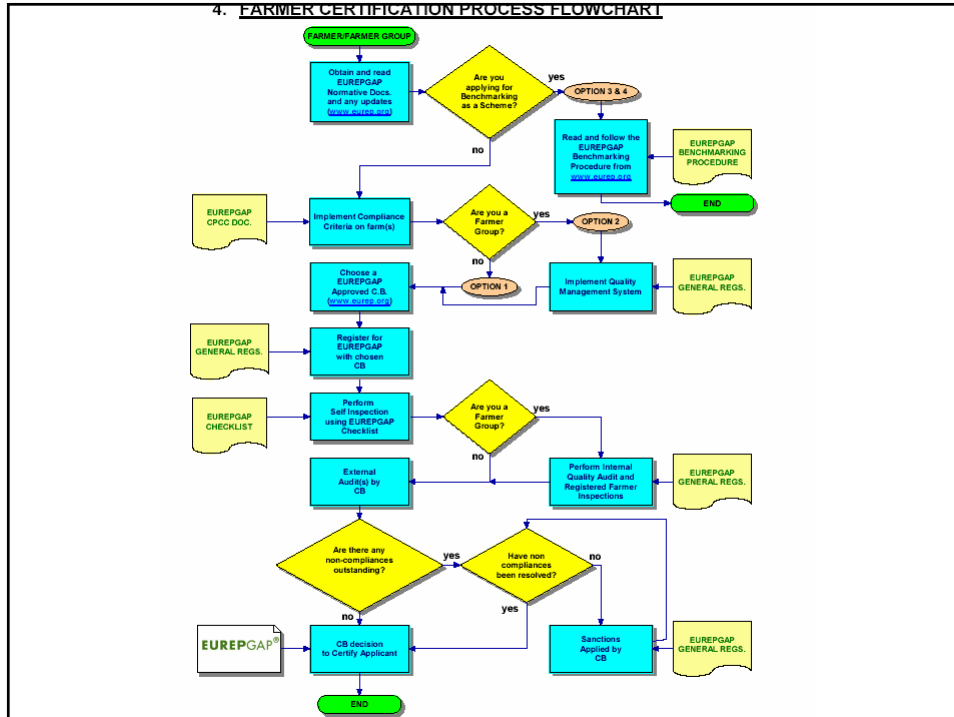
7.1.3 RECOMMENDATIONS:

No minimum percentage of compliance is set.

7.2 All Control Points in the CPCC must be audited, including the *RECOMMENDATIONS*.

7.3 Control Points that are indicated by "No N/A" in the Compliance Criteria field, unless specifically indicated in the respective Compliance Criteria text, must be audited and may not be justified as being "not applicable". Exceptions can only be granted by the EUREPGAP Technical and Standards Committee for *Fruit and Vegetables* and will be published by EUREPGAP as an annex to the CPCC.

4. FARMER CERTIFICATION PROCESS FLOWCHART



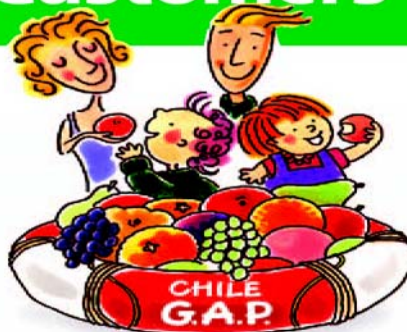


SUPERMARKET MEMBERSHIP WIDENS

ASDA/Walmart	Kesko	Safeway
Albert Heijn	KF	Spar Austria
COOP Italia	Laurus	Superunie
COOP Norge	Marks and Spencer	Superquinn
COOP Switzerland	McDonalds Europe	Somerfield
DelHaize	Metro	Tesco
Eroski	Migros	TSN
Fedis/D.R.C.	Pick 'n' Pay	Waitrose
ICA Handlarna	Sainsbury	

Global Food Safety Initiative of CIES, association of 250 global food retailers
And suppliers to attempt to harmonize food safety standards among members

Caring For Your Customers



The Chilean Fresh Fruit Industry is now actively introducing its Good Agricultural Practices (GAP) initiative on a nationwide scale.

Chile's GAP programme is a proactive voluntary development of the industry aimed at protecting consumers and retailers alike.

Our membership and participation in the main initiatives related to food safety world wide such as; CIES - Global Food Safety Initiative, Eurepgap and 'United' Fresh Fruit And Vegetable Assoc. (USA), runs alongside our

own comprehensive Chile - Good Agricultural Practices scheme.

This means, that the fruit farmers of Chile are complying with their own comprehensive GAP programme as well as strict domestic regulations, which reflect global requirements.

So now more than ever consumers everywhere can be even more confident and reassured about fresh fruit from Chile.

Grown with care, by the fruit farmers of Chile



Chile - World Class Fruit

The Chilean Fresh Fruit Association-Europe,
2 Northfields Prospect, Putney Bridge Road, London SW18 1PE
Tel: 0044 208 875 2340 • Fax: 0044 208 874 5020 • Email: info@cffae.com • Web: www.cffae.com



European View of Value of Such Systems

While certification to EUREPGAP will result in additional costs to growers, there will be numerous benefits. Long-term benefits include more motivated farm workers due to improved facilities, training and better working conditions with a subsequent increase in living standards. This would obviously also result in better productivity and outputs to the ultimate benefit for the grower.

An Alternative View

Cost Associated with Adopting Food Safety Standards Not Limited to but may Include

- **Investment in New Infrastructure (water purification)**
- **Training for Workers to Improve Hygiene in the Field**
- **Upgraded Recordkeeping Systems**
- **Third Party Audits for Compliance with Customer Standards for GAPs in the fields and GMPs in the packing house**

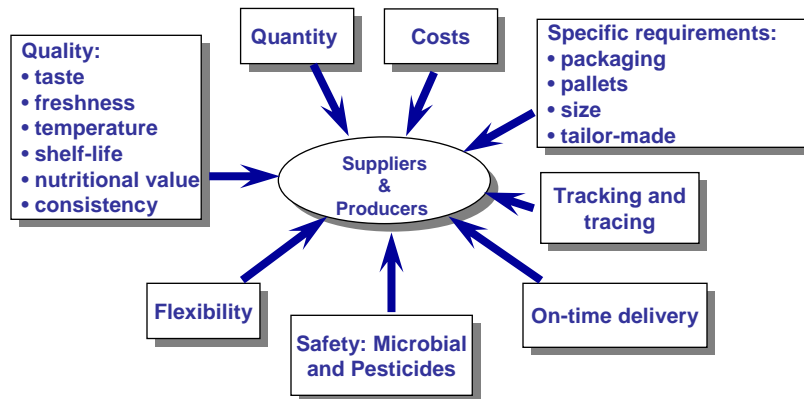
**But Returns to Investment Not Necessarily
Reflected in Price Premium**

- **Reduced Liability in case of Event**
- **Greater Market Access to Buyers
Who Require Third Party Certification**

Examples of Cost Reductions from Traceability Systems

- **Load Sequencing / Raw Product Allocation**
Prior notification of product attributes; allocate incoming
Product to most appropriate processing line
- **Ingredient Management**
selection of food ingredients from raw products based on location
And attributes of alternative lots
- **RFID Asset Tracking**
Tracking raw product field bins

Conclusion: The Future will see increasing multiple demands on Fresh and Processed suppliers and producers while competition will make non-compliance not an option, it is the cost of remaining in the game



Source: Adapted from Rabobank Mexico

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Research Agenda

- Case Studies of Existing Systems
- Survey of Grower/Processors

Cost vs. Attribute Values
Mandatory vs. Voluntary
Government vs. Private
Global Harmonization vs. Barriers to Trade

ARI Project on Traceability Systems in Specialty Crop Industry, CSUF/CAB,
UC/AIC, and CalPolySLO/CISSC