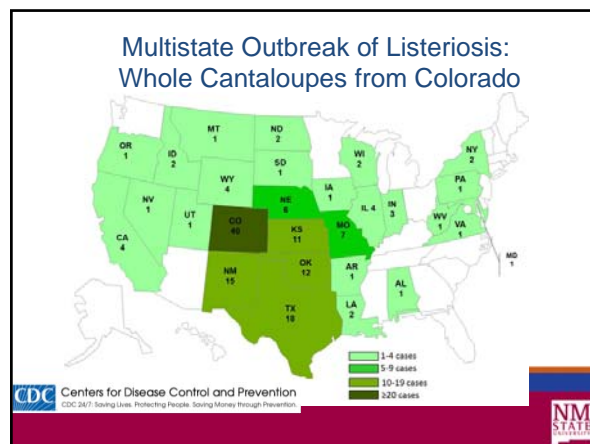


Attack of the Killer VEGIS!!

Nancy C. Flores
Extension Food Technology Specialist

New Mexico State University



Name that outbreak!

Salmonella

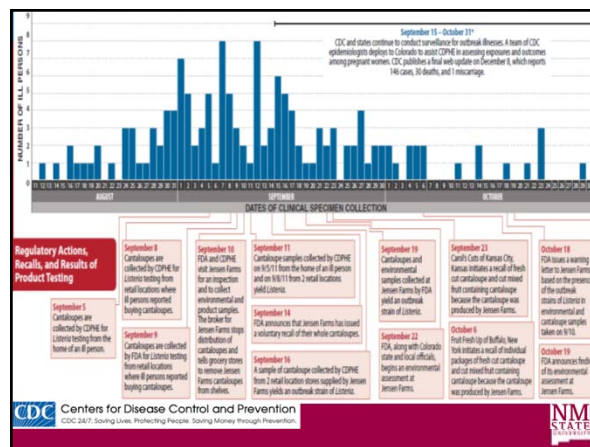
E.Coli O157:H7

Listeria

Norwalk

Salmonella

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73 Produce Outbreaks 2000-2010

• Lettuce/Romaine	15	• Celery	1
• Tomatoes	16	• Mango	1
• Cantaloupe	7	• Green grapes	1
• Raspberries/"berries"	7	• Jalapeno/serrano	1
• "Melons"	5	• Snow peas	1
• Basil/ herbs	5	• Unknown	6
• Spinach	3		
• Green onions	2		

Source: FDA CFSAN

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Listeriosis: Clinical Symptoms

- Eating food contaminated with the bacterium
- Affects older adults, persons with weakened immune systems, and pregnant women and their newborns.
- Fever, muscle aches, diarrhea or other GI symptoms.
- Invasive infection (bacteria spread from the intestines to the bloodstream or other body sites).
- Illness is treated with antibiotics
- Can experience flu-like symptoms 2 months after eating contaminated food

CDC Centers for Disease Control and Prevention
CDC 247: Saving Lives. Protecting People. Saving Money Through Prevention.

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Clean up?

- Listeria bacteria can grow produce and surfaces at room and refrigerator temperatures.
- Wash the inside walls and shelves of the refrigerator, cutting boards and countertops;
- Sanitize with a solution of one tablespoon of chlorine bleach to one gallon of hot water;
- Dry with a clean cloth or paper towel that has not been previously used.
- Wipe up spills in the refrigerator immediately and clean the refrigerator regularly.

CDC Centers for Disease Control and Prevention
CDC 247: Saving Lives. Protecting People. Saving Money Through Prevention.



Poor condition of equipment

- “Clean” Processing equipment showed signs of dirt and product build-up
- Rusted and corroded equipment
- Retro fitted potato washer used to clean melons



Outbreak Summary

- Total of **146 persons** infected from **28 states**.
- Four outbreak-associated strains of Listeria monocytogenes
- **Thirty** deaths were reported.
- one woman miscarried.



CDC Centers for Disease Control and Prevention
CDC 247: Saving Lives. Protecting People. Saving Money Through Prevention.



Improper cooling

- Problems with packing and storage
- Melons were not properly cooled before cold storage



nmsky@yahoo.com



So what went wrong?



Poor working conditions

- Pools of water on the floor



Cross contamination



- Truck used to haul culled cantaloupe to a cattle operation



Weakness of third party audit

- Failure to Audit for Compliance with FDA Guidance and Best Industry Practices
- Failure to Require Correction of Deficiencies
- No Reporting to FDA or State Officials
- Concerns about Advance Notice and Thoroughness of Third -Party Audits
- Potential Conflicts of interest in Auditor Relationships



Auditor gave cantaloupe farm high marks before *Listeria* outbreak

Robert Roos News Editor

Jan 11, 2012 (CIDRAP News) - A private food-safety auditor gave Jensen Farms in Colorado a "superior" rating a few weeks before cantaloupes from the farm were linked to a deadly *Listeria* outbreak, according to a report from a US House committee.



Third party audit failures:

- ❖ **Salmonella outbreak in peanut butter products** sold by the Peanut Corporation of America (PCA). The auditor awarded a "superior" rating then six months later PCA's products killed nine people and sickened 691 people.



ONE HUNDRED TWELFTH CONGRESS
Congress of the United States
 House of Representatives
 COMMITTEE ON ENERGY AND COMMERCE
 2125 RAYBURN HOUSE OFFICE BUILDING
 WASHINGTON, DC 20515-6115

Monthly (202) 225-2927
 Monthly (202) 225-3841
 January 10, 2012

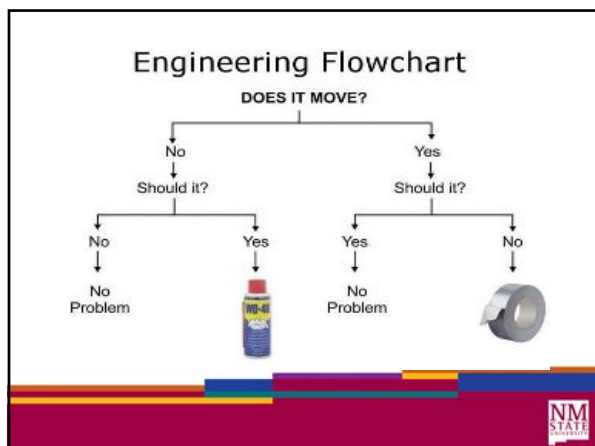
...the investigation identified significant problems with the third-party inspection system used by growers and distributors to ensure the safety of fresh produce, This auditing system is often the first and only line of defense against a deadly food borne disease outbreak.



Third party audit failures:

- **Outbreak of Salmonella in eggs** produced by Wright County Egg revealed after federal officials inspected facilities that serious violations of food safety standards, including barns infested with mice, chicken manure piled eight feet high, and uncaged hens tracking through excrement. Two months before the outbreak, rated "superior" by auditor.





- ## USDA GAP Audit
- **Part 1: Review of farm operation**
 - **Part 2: Harvesting & field packing activities**
 - **Part 3: Packing house/shed facility**
 - **Part 4: Storage and transportation**
 - **Part 5: (reserved)**
 - **Part 6: Wholesale distribution center**
 - **Part 7: Preventive food defense procedures**

Table 1. Pathogens associated with fresh produce commodities from 1996 to 2006
(Adapted from RTI International 2009)

Commodity and category In order of prevalence associated with a foodborne outbreak	Pathogen In order by commodity
1. Leafy greens = Lettuce, mesclun, spinach, romaine, leaf, iceberg, bagged lettuce	E. coli O157:H7 (EHEC) Salmonella enterica Norovirus
2. Tomatoes = Roma, cherry, grape	Salmonella enterica Norovirus
3. Melons = Watermelon, cantaloupe, honeydew, musk	Salmonella enterica E. coli O157:H7 (EHEC)
3. Crucifers = Cabbage, coleslaw, broccoli	E. coli O157:H7 (EHEC) Cryptosporidium parvum
4. Mixed produce = Salads (lettuce, vegetable or fruit based, garden, green, house, chef, cucumber); mixed vegetables, mixed fruit, green bean	E. coli O157:H7 (EHEC) Salmonella enterica
4. Carrots	Salmonella enterica

Good Agricultural Practices & Good Handling Practices Audit Verification Program Scoresheet

Scopes Requested	Element	EVALUATION ELEMENTS									
		Possible Points	Less NA Points	Adjusted Points	Passing Score*	Facility Score	Pass	Date Passed	General Questions	Reviewing Official	Un-announced
X	General Questions	180									
	Part 1 - Farm Review	190									
	Part 2 - Field Harvesting & Field Packing Activities	185									
	Part 3 - House Packing Facility	290									
	Part 4 - Storage and Transportation	255									
	Part 6 - Wholesale Distribution Center/ Warehouses	410									
	Part 7 - Preventative Food Defense Procedures	180									

*A Passing Score is 80% of the Possible Points or the Adjusted Points. If adjustment are necessary, with no "automatic unsatisfactory" conditions is required for certification.

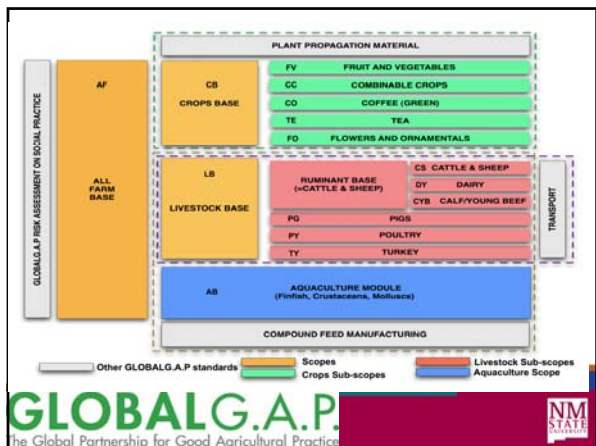
Commodity Specific Food Safety Guidelines for the Melon Supply Chain

1ST EDITION

GUIDANCE FOR PRODUCE: Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables

GAPs Audit Score

****A Passing Score is 80% of the Possible Points or the Adjusted Points, if adjustment are necessary, with no "automatic unsatisfactory" conditions is required for certification.**



Harmonized GAPs

	Requirement	Procedure	Verification	Corrective Action
I. General Questions				
1.1. Management Responsibility				
1.1.1.	A food safety policy shall be in place.	A written policy shall outline a commitment to food safety, in general terms, how it is implemented and how it is communicated to employees, and be signed by Senior Management.	The auditor observes the food safety policy, observes that it is signed by Senior Management, and observes that it has been communicated to all employees in a manner that can be understood.	The operation creates or revises the policy, or its communication to employees, to be in compliance.
1.1.2.	Management has designated individual(s) with roles, responsibilities and resources for food safety functions.	The food safety plan shall designate who has the responsibility and authority for food safety, including a provision for the absence of key personnel. Twenty-four hour contact information shall be available for these individuals in case of food safety emergencies. The organization's senior management shall determine and provide, in a timely manner, the resources needed to implement and maintain the food safety plan.	Auditor observes that the food safety plan has identified individual(s) for key food safety activities. Auditor verifies that procedures include provisions for when the identified individual is not present. Auditor observes whether Senior Management has provided the resources needed to implement and maintain the food safety plan.	Operation identifies individual(s) for key food safety activities in the food safety plan. Operation identifies actions to be taken when the identified individual(s) are not present. Senior Management commits resources needed to implement and maintain the food safety plan.

GLOBALG.A.P. Integrated Farm Assurance - All Farm Base ENGLISH VERSION

№	Control Point	Compliance Criteria	Level	Yes	No	N/A	Justification
AF	ALL FARM BASE	Control points in this module are applicable to all producers seeking certification as it covers issues relevant to all farming businesses.					
AF.1	SITE HISTORY AND SITE MANAGEMENT	One of the key features of sustainable farming is the continuous integration of site-specific knowledge and practical experience into future management planning and practices. This section is intended to ensure that the land, buildings and other facilities, which constitute the fabric of the farm, are properly managed to ensure the safe production of food and protection of the environment.					
AF.1.1	Site History	Compliance must include visual identification in the form of a physical sign at each field/stand; greenhouse/yard/pool/livestock building/green or other farm area/abattoir, or a farm plan or map that could be cross-referenced to the identification system. No N/A.	Minor	Must			
AF.1.1.1	Is a reference system for each field, orchard, greenhouse, yard, plot, livestock buildings, and/or other area/location used in production established and referenced on a farm plan or map?						
AF.1.1.2	Is a recording system established for each unit of production or other area/location to provide a record of the livestock/aquaculture production and/or agronomic activities undertaken at those locations?	Current records must provide a history of GLOBALG.A.P. production of all production areas. No N/A.	Major	Must			

All questions on the Produce GAPs Harmonized Food Safety Standard, Pre-Farmgate - USDA Checklist shall be assessed according to the Verification Instructions outlined in the Produce GAPs Harmonized Food Safety Standard. Auditors shall have a copy of the Standard with them when performing audits to verify questions are assessed appropriately. All questions shall be assessed using one of the following:

Compliant (C) - The operation meets the requirements of the Harmonized GAP Standard
Corrective Action Needed (CAN) - The operation does not meet the requirement(s) of the Harmonized GAP Standard, however the non-conformance is not considered to be an immediate food safety risk.
Immediate Action Required (IAR) - The operation does not meet the requirement(s) of the Harmonized GAP Standard and the non-conformance is considered an imminent food safety risk. An imminent food safety risk is present when produce is grown, processed, packed or held under conditions that promote or cause the produce to become contaminated. Observation of employee practices (personal or hygienic) that jeopardize or may jeopardize the safety of the produce are considered an "IAR". The presence or evidence of rodents, an excessive amount of insects or pests are also considered an "IAR".
Not Applicable (N/A) - The question is not applicable to the operation.

H-GAP Checklist

GLOBALG.A.P. The Global Partnership for Good Agricultural Practice

TYPE OF INSPECTION: ANNOUNCED UNANNOUNCED OTHER:

OPTION 1 OPTION 2 MEMBER

PARALLEL PRODUCTION PARALLEL OWNERSHIP

DURATION: _____

LOCATIONS VISITED: _____

PRODUCTS PRESENT DURING THE INSPECTION: _____

CALCULATION OF THE 95% MINOR MUST COMPLIANCE: _____

http://www.globalgap.org/cms/front_content.php?idart=1440



In plain sight:

FDA report: Factors that likely contributed to the contamination of cantaloupes:

Growing Environment:

- Low level sporadic *Listeria monocytogenes* in the agricultural environment and fruit contributed to the introduction of the pathogen into the packing facility.



Packing Facility and cold Storage:

- **A truck used to haul culled cantaloupe** to a cattle operation was parked adjacent to the packing facility.
- **Facility design allowed for the pooling of water** on the packing facility floor adjacent to equipment and employee walkway access to grading stations.



QUESTIONS?

- NM GAPs CONTACT:
- Local CES county agents
- USDA GAPs
- Harmonized GAPs
- Global GAPs
- NMSU Extension Food Technology GAP website:



<http://aces.nmsu.edu/ces/foodtech/gap-nm.html>
naflores@nmsu.edu 575-646-1179



Packing Facility and cold Storage:

- The packing facility **floor was not easily cleanable;**
- The packing **equipment was not easily cleaned and sanitized.**
- The washing and drying equipment **was previously used** for postharvest handling of another raw agricultural commodity.
- There was no **pre-cooling step to remove field heat** from the cantaloupes before cold storage.

