I. *California Egg Quality Assurance Plan Core Components for Egg Processing*

Don Bell  
University of California  
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Riverside Campus

II. *USDA’s Quality and Sanitation Concerns – A Review of USDA’s Role*

Don Dixon  
U.S. Department of Agriculture  
Agricultural Marketing Service  
Poultry Grading Division  
Modesto, CA

III. *Minimum Facilities and Operating Requirements for Shell Egg Grading and Packaging Plants*

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IV. *Monitoring Plan and Equipment Operation and Record Verification*

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and

Don Bell  
University of California  
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Riverside Campus
V. California Egg Quality Assurance Plan
   Egg Handling Component
   Sample Record Forms

VI. Egg Washing and Egg Room Management
    Don Bell
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VII. Chemical Use in the Shell Egg Processing Plan
     Don Dixon
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     Agricultural Marketing Service
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VIII. Egg Quality Assurance – General Comments
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      Extension Service
      Riverside Campus
California Egg Quality Assurance Plan
Core Components for Egg Processing

Don Bell
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Riverside Campus

1. Facilities and equipment must be kept clean and in good repair and shall be completely washed at the end of each day’s operation.

2. Lighting should be adequate to properly identify egg defects in the candling booth and the processing area.

3. Potable water with less than 2ppm of iron shall be used.

4. Wash water shall be maintained at 90 degrees F. or higher and at least 20 degrees F. higher than the temperature of the eggs to be washed.

5. A USDA approved cleaning compound shall be used in the wash water.

6. Wash water shall be added continuously and replaced every 4 hours.

7. Washed eggs shall be spray rinsed with warmer water than the wash water and a USDA approved sanitizer.

8. If eggs are to be oiled, follow USDA guidelines.

9. Refrigerate eggs according to applicable federal, state or local laws.

10. Label egg cartons and cases with a “Keep Refrigerated” descriptor to educate consumers about perishability.

11. Label egg cartons and loose pack eggs with a Julian pack date to assist with product rotation. An optional “sell by” date may be used at the discretion of the packer as long as it does not exceed 30 days from date of pack.

12. Label cartons and cases with plant of origin number, and if possible, with a flock identification number.

13. Plastic egg flats should be washed and sanitized after each use or returned to the originating farm to avoid cross contamination. Fiber egg flats can not be sanitized they must be returned to the farm of origin.

14. Egg cartons and soiled fiber flats should not be reused.

15. Retail returns should not be reprocessed for retail shell egg sales.

16. Label eggs with a quality assurance seal only if produced in California by producers participating in the California Egg Quality Assurance Plan.
The U.S. Department of Agriculture (USDA), Agricultural Marketing Service (AMS) was established by an Act of Congress in 1946. The “Act” was passed in order to establish a Nationwide Government agency to assist farmers, producers, brokers, buyers, and sellers in marketing their products on a local and nationwide basis.

They accomplished this task by establishing the Uniform Standards of Quality and Weight Ranges for Shell Eggs. Industry and government worked together in writing: “The U.S. Standards and Weight Classes for Shell Eggs” (better known as the USDA Regulations).

The Poultry Grading Branch oversees the following programs:

- Shell Egg Grading
  - 40% of shell eggs that go to US consumers
- Poultry Grading
  - 80% of turkeys
  - 60% of chickens
- Egg Products Inspection
  - All egg products

USDA Graders make quality determinations bases on the U.S. Standards. This gives industry an unbiased third party opinion on product quality. USDA Certificates lets the buyer know about product quality without the buyer seeing the product.

Yardsticks for Measuring Quality
Standards and Grades form a uniform yardstick or measure that:

- Describes the commercial quality of various products so their value, utility, and price can be determined.
- Serves as a common language for market news reports.
- Provides a uniform basis for competitive bidding on food procurement contracts.
- Helps processors obtain uniform quality so they can take advantage of mass handling.

USDA Shell Egg Graders are responsible for:
• Applying the official U.S. Grade Standards to grading results to determine a product’s grade.
• Approve labels for graded products that bear the USDA shield.
• Authorize selected plant personnel to grade eggs according to U.S. Standards and monitor their work.
• Ensure an acceptable level of compliance with program policies, resolve operating problems, and coordinate grading services with plant production activities.
• Conduct fact finding studies to monitor program effectiveness and identify any changes that are needed in grading and related activities.
• Certify that products meet requirements in food procurement contracts for such things as: quantity, condition, net weight, packaging, storage, and transportation.
• Approve facilities, equipment, sanitation, and operating procedures in shell egg plants using the grading service.
Minimum Facilities and Operating Requirements for Shell Egg Grading and Packaging Plants

Don Dixon
U.S. Department of Agriculture
Agricultural Marketing Service
Poultry Grading Division
Modesto, CA

Building and Premises

- Buildings need to be of sound construction
- Walls and floors need to be readily cleanable
- Adequate precautions need to be taken to prevent the entrance of vermin.
- Outside premises need to be free of trash, rubbish, weeds, and surplus equipment.
- Adequate drainage needs to be provided.
- Floor drains need to be trapped.
- A system for the daily removal of trash needs to be followed or a separate refuse room or designated area needs to be provided.
- Pesticides, rodenticides and insecticides need to be approved and handled according to the manufacturer’s instructions.

Requirements for Cooler Rooms and Equipment

- Coolers shall have refrigeration facilities capable of reducing within 24 hours and holding the maximum volume of eggs handled to 60 degrees F. or below.
- Coolers shall be free from objectionable odors and mold, and shall be maintained in a satisfactory condition.
- All shell egg coolers shall be equipped with a working thermometer (temperature) and hygrometer (humidity).
- Humidifying equipment capable of maintaining a relative humidity to minimize shrinking shall be provided.
- Clean floor racks and pallets shall be provided for product in coolers.

Supply Rooms

- Dry storage rooms are to be kept clean and orderly.
- Supplies are to be on floor racks or pallets.
- Supplies are to be protected from dirt, dust, birds, excess moisture, etc.

Lavatory Facilities

- Facilities must be adequate in number and maintained in a good operating condition.
- Room needs to be readily cleaned.
- Ventilation is to be to the outside of the plant.
- Adequate supply of hot and cold running water.
• Personal facilities like soap, towels, hand dryers, trash containers must be provided.
• Signs must be posted instructing employees to wash their hands before returning to work.

Grading and Packaging Rooms
• The room needs to be of sufficient size to permit the installation of the necessary equipment and the conduct of grading and packaging of shell eggs in a sanitary manner.
• The room is to be kept “reasonably clean” during processing operations.
• The room needs to be properly ventilated.
• No wood benches or platforms in areas that are subject to moisture.
• Wood walls or partitions that are subjected to moisture and develop odors shall be replaced with materials that are impervious to water.
• The room shall be adequately darkened so that the candlers can make accurate quality determinations.
• Crossbeams or light reflection from the candling lights shall be minimized.
• Candling lights shall be capable of providing a uniform intensity of light at the candling aperture to facilitate accurate quality determinations.
• Individual egg scales need to be provided to check the accuracy of weight classing.
• All weighing equipment, whether manual or automatic, shall be kept reasonably clean and capable of ready adjustment.
• Test weights to check above scales will need to be provided.
• The plant needs to have a sufficient amount of equipment to adequately clean the room and processing machinery, i.e., water hoses, vacuums, air hoses and brushes, scrapers, etc.

Sanitation
• Plant management is responsible for producing shell eggs under sanitary conditions.
• All buildings, rooms and equipment shall be in good repair and sanitarily maintained.

USDA Standards Require:
• That the resident grader conduct a sanitation inspection of the plant before or immediately upon startup of operations.
• Graders are responsible for identifying sanitation problems and requiring corrective action.
• Critical problems require immediate correction.
• Non-critical problems require timely correction.
Critical Sanitary Problems

- Deficiencies that may affect the product through:
  - Direct contact
  - Exposure with the unsanitary equipment or condition.

Examples:
- Dirty conveyor spools
- Belts
- Washers
- Shell egg oiling equipment
- Drying fans
- Scales
- Drop chutes
- Packing heads

Non-critical Sanitation Problems:

- Deficiencies that do not directly affect the product.

Examples:
- Dirty cooler floor
- Exterior parts of washers
- Supply rooms
- Ceilings
- Break room
- Dock area

Definition of “Reasonably Clean”

- A state of cleanliness which will not obviously create a contamination hazard or visibly soil the product.

Example:
- An occasional spot of dried egg would be acceptable in an area that the regulations only require reasonable cleanliness, but in the same situation, the presence of visible mold growth would be unacceptable because a contamination hazard obviously exists.

Shell Egg Cleaning Operation

- Shell egg cleaning equipment shall be kept in a state of good repair.
- The temperature of the wash water shall be maintained at a temperature of 90 degrees F. or higher and shall be at least 20 degrees warmer than the temperature of the eggs to be washed.
- An approved cleaning compound shall be used. The use of metered equipment for dispensing the compound into solution is recommended.
• Wash water shall be changed approximately every 4 hours or more often if needed to maintain sanitary conditions and at the end of each shift.
• Remedial measures shall be taken to prevent excess foaming during the egg washing operation.
• Replacement water shall be added continuously to the wash water to maintain a continuous overflow.
• Rinse water, chlorine, or quaternary sanitizing rinse may be used as part of the replacement water, as long as they are compatible with the shell egg cleaning compound.
• Iodine sanitizing rinse is the exception to this rule.
• Only potable water may be used to wash eggs.
• Each plant will submit certification proving that the iron content of the water supply is less than 2 parts per million.
• Water is tested for potability at the following rate: Municipal water supply – once per year; Well water – every six months or whenever wells are changed.
• Samples are to be sent to the State-approved certifying agency.
• Wastewater from the washing operation shall be piped to drains.
• The washing and drying operations shall be continuous. Egg shall not be allowed to stand and soak in water. Immersion type washers shall not be used.
• Pre-wetting eggs prior to washing may be accomplished by spraying a continuous flow of water over the eggs in a manner which permits the water to be drained away. The temperature shall be the same as prescribed earlier.
• Washed eggs shall be spray rinsed with an approved sanitizer of not less than 50 ppm and not more than 200 ppm of available chlorine or its equivalent.
• Test kits shall be provided and used to determine the strength of the sanitizing solution.
• During breaks or rest periods, eggs should be removed from the washing and rinsing areas of the washer and from the scanning area whenever there is a buildup of heat.
• Washed eggs should be reasonably dried before cartoning or packaging.
• Steam or vapors from the washing operation shall be continuously vented to the outside of the building.

Shell Egg Treating Equipment
• Oiling equipment needs to be maintained in satisfactory operating condition.
• Equipment has to be kept clean.
• Oil has to be USDA approved.
• Equipment and oil has to be protected from dirt when not in use.

Shell Egg Protecting Operations
• Eggs with excess moisture on the shells shall not be shell protected.
• Oil having any off odor, or that is obviously contaminated, shall not be used.
• Processing oil that has been previously used and which has become contaminated shall be filtered and heat treated 180 degrees F. for 3 minutes prior to use.

Health and Personal Hygiene
• Plant personnel coming into contact with the product shall wear clean outer clothing.
• No person known to be infected with a communicable or infectious disease shall be permitted to come into contact with the product.
• Use common sense and good food handling and manufacturing practices.
Record keeping is Important

- Records are written evidence that document an activity.
- If you don’t write it down, it’s the same as not doing it.
- Record keeping is not only an activity, but it also should be a system.

Record keeping – Regulatory Perspective

- Shows that limits or regulations are being met by recording and monitoring the results.
- Documents that action was taken to bring a problem or situation under control.
- Documentation of product traceability from start to finish.

Record keeping – Industry Perspective

- Provides evidence that product meets processing requirements.
- Provides plant and regulatory personnel with documentation of compliance.
- Facilitates program review by identifying problem areas.
- Provides a tracking system in case of recalls.

### USDA Records

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Twice Per Day

Example of Documentation
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<td>Egg Temp</td>
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<td>Wash Water Temp</td>
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<td>Sanitizer PPM</td>
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Other Types of Records
1. Grading results (times, brand, sample #, flock)
2. Day code 4 digit lot number
3. Graders signature
4. Plant name
5. Grade, size, brand of eggs packed
6. Cases packed
7. Number of samples
8. Retention information
9. Machine number

Tips in Record keeping
- Write clear, concise and consistent
- Document legibly
- Don’t over document
- Show corrective actions when noting discrepancies
- Setup retention files for records
- Review and make necessary changes when applicable
- Sign and date all records

Record keeping Pitfalls
Common Errors
- Entering information ahead of time
- Entering false or misleading information
- Failure to enter information
- Failure to record deviations or corrective actions

California Egg Quality Assurance Program
Records required for “Egg Handling” Component
Internal egg temperature
Wash water temperature (2x/shift)
Rinse water temperature (2x/shift)
Sanitizer level (2x/shift)
In-coming cooler temperature and relative humidity % (2x/shift)
Out-going cooler temperature and relative humidity % (2x/shift)
Sanitizer nozzles operable? (2x/shift)

Record of Egg Plant Processing Plant Chemical Usage

| Date: | __________________________ |
| Name of Product: | __________________________ |
| Purpose: | __________________________ |

Enter new data for each change of product
Periodic Cleaning and Maintenance Egg Processing Plant and Equipment

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<td>Comments:</td>
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Periodic Cleaning & Maintenance Examples

- Major equipment maintenance
- Replace filters
- Clean refrigerator coils
- Clean walls and ceiling
- Clean ventilation ducts
- Replace cooler pads
- Paint equipment & facilities
## Egg Washer Log (2x per shift)

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# Cooler Temperature Log

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# DAILY EGG PROCESSING LOG

**Company:** ____________________  **Plant:** ____________________

**Date:** ____________________

**Quality control supervisor:** ____________________

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Quality Control Supervisor (signature) ________________________________
## RECORD OF CHEMICAL USEAGE

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Quality Control Supervisor (signature) ____________________________
Egg Washing and Egg Room Management
Don Bell
University of California
Extension Service
Riverside Campus

USDA Plant Sanitation
“All operations should be conducted so that the product (eggs) handled will not be adversely affected, especially with respect to wholesomeness.”

General Plant Sanitation Requirements (USDA)
• Prevent entrance or harboring of vermin (rodent, birds, insects)
• Grading and Packing rooms “Reasonably clean during work hours. Thoroughly cleaned daily.”
• Clean and sanitary rest rooms
• Equipment and structure impervious to moisture
• Employees
• Free of communicable disease
• Clean hands and clothing

General Tips
• Produce clean sound shell eggs
• Clean eggs as quickly as possible
• Avoid washing cracked or very dirty eggs
• Use recommended water temperatures for washing and rinsing – check your thermometers
• Use only approve detergents and sanitizers
• Remove eggs from washer during breaks
• Change water every 2-4 hours (or oftener)
• Test sanitizer levels frequently
• Check all nozzles for effectiveness of spray
• Equipment must be maintained and cleaned thoroughly each day of operation

USDA Regulations for Grade AA and Grade A Eggs
Eggs must be clean – Defined as: “free from foreign material and from stains or discolorations that are readily visible.”

“An egg may be considered clean if it has only very small specks, stains, or cage marks if such specks, stains, or cage marks are not of sufficient number or intensity to detract from the generally clean appearance of the egg.”

Do eggs have to be washed?
Eggs are not required to be washed in the US but they must be clean!
Two Differing Philosophies About the Need for Washing Eggs
In the US “All eggs are assumed to be dirty and therefore are washed.”
In other countries “Most eggs appear to be clean and therefore, are not washed.”

Egg Shells are Porous
Temperature Guidelines
Wash water must be at least 90 degrees F for efficiency of cleaning (USDA Regs)
Wash water must be at least 20 degrees F higher than internal egg temperature to avoid interior egg contamination (USDA Regs)
Maximum internal egg temperature to wash water differences should be 50 degrees F to avoid thermal chex
Maximum temperature of wash water is 128 degrees F to avoid internal damage to the eggs

Egg Temperature Rise During Washing
Depends Upon:
Original egg temperature
Wash water temperature
Time exposed to the water

Typical Change in Internal Egg Temperature During Washing
<table>
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<th>Original Temp F</th>
<th>Final Temp F</th>
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Separation of cracks and dirties during gathering reduces the number of eggs lost during washing, maintains cleaning efficiency of the wash water, and reduces egg contamination problems.

Washing Cracked Eggs?
Cracks are changed into losses
Age of flock %
20-39 weeks 5.3
40-59 weeks 8.8
60-79 weeks 11.3
Avg 8.3

Economic Effects of Washing Cracked Eggs
8.3 % of cracks (@$.30 per dozen) are converted to loss (@ $.00 per dozen)
Washing efficiency is reduced requiring more detergent
Wash water becomes contaminated which increases the risk of egg contamination

Cost of Chex and Losses
A 1% reduction in chex is worth $.05 per hen/year
A 1% reduction in losses is worth $.10 per hen/year

Detergent and Sanitizers
Never randomly mix detergents and sanitizers
Chlorine and quats will neutralize each other
Use only USDA registered materials

Problems with Sanitizing
Inadequate sanitizer levels use test kit 50-200 ppm chlorine
Incomplete coverage check nozzles for plugging and spray pattern
Rinse water temperature 10-20 degrees F over wash water temperature

If Egg Spoilage Occurs
- Check was water temperatures
- Low iron content (less than 2 ppm)
- Use only alkaline detergents
- Maintain chlorine levels in rinse water at 50-200 ppm
- Change water frequency (every 2-4 hrs)
- Drain tanks after use
- Maintain continuous overflow

Iron in Water Supply
Encourages Pseudomonas spoilage
Maintain less than 2 ppm levels

Egg Sweating
Cool eggs will sweat whenever they are abruptly exposed to warmer air carrying a high enough relative humidity.

The danger from handling sweating eggs is that the moisture on the shell, when agitated by handling may cause bacteria or molds from your hands or on the egg shell to become water-borne and pass through the shell pores to the inside of the egg. Egg spoilage could easily be the result.

Egg Cooling
- Store eggs at 34 degrees F
- Maintain 80+% relative humidity
- Separate stacks to allow cold air to reach freshly packed eggs
- Provide air flow within the cooler to facilitate rapid cooling
Chemical Use in the Shell Egg Processing Plan

Don Dixon
U.S. Department of Agriculture
Agricultural Marketing Service
Poultry Grading Division
Modesto, CA

Most all chemicals and compounds used in USDA plants require evaluation and approval by USDA.

Products are evaluated at the: Compounds and Packaging Branch, Product Assessment Division, USDA, FSIS, Beltsville, Maryland

Products are evaluated for: Intended use; Complete chemical composition; Labeling; Ingredients

Compounds That Do Not Require Evaluation: Outdoor pesticides; Cleaning compounds used in offices and break rooms; Scouring pads, towels, cloths, etc.; Pest control devices – sticky boards, fly paper, traps, etc.

Compounds That Do Require Evaluation:
- Cleaning compounds – soaps, acid cleaners, caustics, scouring cleaners, floor and wall cleaners, metal cleaners, polishers
- Compounds used in non-processing areas – lavatories and dressing rooms, inedible processing areas, coolers, docks, dry storage, etc.
- Employee hand care compounds
- Handwashing and sanitizing compounds
- Hand creams, lotions and cleaners
- Pesticides and nonresidual: fumigants, sprays, powders, baits, rodenticides
- General potable water treatment compounds, chlorines, silicates, phosphates, etc.
- Miscellaneous water – compounds used in cooling and retort water, boilers, steam lines, corrosion control, etc.
- Miscellaneous other: soluble oil, solvent cleaners, glue removers, drain cleaners, lubricants, adhesives, degreasers, oils

Compounds For Use on Shell Eggs
- Shell egg cleaning compounds
- Shell egg destaining compounds
- Shell egg sanitizing compounds
- Foam control compounds
- Mineral oil used in shell protection
- Inks used to mark eggs
Chemical Compound Common Sense Facts
Insecticides and rodenticides should be stored in an area away from the processing areas, packaging supplies, and other compounds used in the plan. Approved cleaning and sanitizing compounds should be stored in an acceptable non-processing area separate from packaging supplies, edible ingredients, insecticides and rodenticides.

All compounds are to be used according to the manufacturer’s instructions
Read the label on all chemicals before you use them
The label will tell you:
Name of the chemical
Use precautions
NFPA hazard classification
First aid procedures

Do’s and Don’ts
• Don’t mix chemicals together unless compatible. Never mix chlorine compounds to acid cleaning solutions.
• Don’t double the amounts used thinking it will do twice as good a job.
• Don’t use old outdated chemicals.
• Do use personal protection equipment as directed when handling chemicals.
• Do consult with your sales representative from the chemical company.

Sanitizer
Quaternary Ammonium Compounds
Advantages:
• Odorless
• Tasteless
• Noncorrosive to equipment
• Stable, long shelf life
Disadvantages:
• Ineffective against gram negative bacteria, e.g. Pseudomonas
• Incompatible with some soaps and detergents
• Impaired efficiency in hard water
• Expensive

Iodine Compounds
Advantages:
• Effective against all bacteria
• Quick microbial action
• Stores well
Disadvantages:
• Unstable in hard water or when excessive organic materials are present
• Effectiveness is impaired when alkali detergent residues are on the shell
• Clear water rinse is needed prior to sanitizing
• Strength is weakened at temperatures above 120 degrees F
• Some formulas are expensive

Chlorine Compounds
Advantages:
• Effective against all bacteria
• Economical
Disadvantages:
• Bacterial action adversely affected by excess amounts of organic materials
• Very corrosive
• Corrosiveness increases as temperature increases
• Vapors can be irritating with adverse effect on skin

Functions of Effective Detergents
• Rapid penetrating power
• Ability to control water hardness
• Sufficient power to keep the removed soil from redepositing
• Easily rinsed
• Noncorrosive to equipment

Chemistry of water as it relates to cleaning
Water acts as a solvent and carrier for ingredients in cleaning compounds
Therefore water should be used for
• Calcium
• Magnesium
• Chlorides
• Carbon Dioxide
• Iron
• Sulfates
• Manganese
• Sulfur

Variables of Cleaning
• Time
• Temperature
• Concentration
• Mechanical Action
Egg Quality Assurance – General Comments
Don Bell
University of California
Extension Service
Riverside Campus

Problems with Cooling Eggs
• High initial egg temperature
• In-line eggs can be 90+ degrees F
• Not enough time to cool eggs prior to packaging
• Packing materials insulate the eggs from cold air
• Palletizing insulates interior eggs from cold air
• Storage time is oftentimes too short to get temperatures down
• Optimum temperatures of 45 degrees F should apply to “egg” temperature and not room temperature
• Temperature storage below 50 degrees F is conducive to egg sweating

Rotation of Eggs
• A Major Problem
• The orderly rotation of eggs…
• In the in-coming cooler
• In the out-going cooler
• In the warehouse
• In the back rooms of the supermarket is a major problem relative to preserving high interior egg quality
• Delay offers multiple opportunities for the mishandling of the product
• There should be little reason why eggs are not in the hands of the consumer within on week of lay!

Labeling Requirements
• Pack date on cartons (Julian date)
• Packing plant identification
• “Keep Refrigerated” statement
• “Sell by” date (optional)
• Flock code and/or farm code (optional)

• The Effect of Egg Storage Temperature on Salmonella enteritidis Growth
  • SE inoculated into the yolk was able to grow when stored at 46 degrees F. At 50 degrees, growth was slow. At 54 degrees the organism grew relatively rapidly. Humphrey, 1990
• No Significant growth was observed when the inoculated eggs were held at 45 degrees for up to 94 days. Bradshaw, 1990

• SE can multiply to substantial numbers if held at 50 degrees for a significant period of time. Storage at 45 degrees or below effectively prevents multiplication of SE in the eggs. Kim, 1989

• Effect of Wash Water Temperature and Water pH on Salmonella Survival
  • Higher survival of microorganisms, including SE when washer temperatures were 90 to 95 degrees F and lower wash water pHs (9&10) were used.

Laboratory studies showed
  • At pH of 11, SE died very rapidly at all temperatures
  • SE died most rapidly at higher temperatures 110+ degrees F
  • SE died more rapidly at higher detergent concentrations and with lower egg solids concentrations

Why are food service establishments and institutions involved in outbreaks?
  • Higher susceptibility in institutional settings
  • Time and temperature abuse during storage and/or preparation
  • Inexperienced food handlers
  • Contamination of utensils
  • Pooling of a large number of eggs
  • Some use of lower quality eggs

Common Deficiencies in California Egg Processing Plants
  • Relatively few records are kept (except by USDA)
  • Container coding – Julian pack date not used, beyond 30 days sell-b-date
  • “Keep Refrigerated” statement lacking or hard to find
  • Moist eggs being packed
  • Inoperable sanitizer nozzles
  • Hard to clean interior surfaces
  • Many plants are extremely cramped for space

Suggestions to Reduce Contamination Loads in Egg Processing Plants
  • Sort heavy dirties and leakers during collection and keep them away from the processing plant
  • Keep egg storage carts away from manure – dirty cart wheels bring manure into the processing plant
  • Wash plastic filler flats as often as needed. These are very good sources of plant contamination
• Consider more frequent changing of wash water, especially when processing eggs from older flocks
• Schedule major plant and equipment clean-ups at least quarterly