

FACT SHEET

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MAINTAINING EGG QUALITY THROUGH PROCESSING AND DISTRIBUTION

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Maintenance of egg quality through processing and distribution requires the constant attention of all personnel involved in these activities. Egg quality cannot be improved after the egg is laid. The egg is at its peak in quality immediately after lay. Thus, efforts to maintain quality must begin at this time. When considering the maintenance of egg quality, the two primary concerns are interior quality and shell quality.

Interior Quality

Breakdown in the egg begins immediately after the egg is laid, primarily through the loss of water and carbon dioxide (CO₂). CO₂ loss results in a change in pH of the egg, causing breakdown of the thick white protein structure and thinning of the egg contents.

Control of two factors will minimize these problems. Frequent collection, especially in the summer months, and prompt cooling of the eggs will maintain quality. The Texas Egg Law states that eggs must be cooled below 60 degrees F, but best results are obtained at approximately 50 degrees F. Shell treating (coating the egg shell with a light mineral oil) can replace on-farm refrigeration for short periods. Oiling maintains interior egg quality as effectively as refrigeration when used soon after collection and also reduces energy use on the farm.

Shell Quality

This is influenced by the nutrition and management of the hen and physical or impact damage to the shell. A simple test consisting of the two-tub specific gravity measurement, if made on a regular basis (once a week), enables the producer to determine if excessive breakage is related to nutrition-management or actual physical damage.

To minimize physical shell damage, consider the collection system used. Manual collection systems require frequent gathering to reduce damage in the house. The most important factor is motivation of the worker collecting the eggs. This worker must be impressed with the importance of care and handling.

Automated collecting systems, such as those of an in-line production-processing operation, require a great deal of attention. The collection belts from the cage units are important, especially when elevators lower or raise eggs to the main conveyor belts transporting eggs to the processing area. Worn pads on the elevator increase egg slippage and breakage. Other types of elevators require periodic adjustment to insure correct transfer of eggs from the belt to the elevator cups. Breakage as high as 40 percent has been noted for systems which allow a 1 to 2 inch drop. Replace or repair worn equipment at the point of transfer from the elevator to the main conveyor belt.

Frequently inspect turns (elbows) which transport eggs to the processing facility. Proper adjustment of belt height to the cross belts maintains a smooth, constant flow of eggs. Clean feathers and other debris from the egg handling system periodically to minimize shell damage at transfer points. Inspect all belts frequently. Replace worn belts to reduce impact damage from piling of eggs along edges of belt.

Inspect and clean vacuum-lifting equipment periodically to reduce damage from dropping single or multiple eggs. Adjust the egg orienter before washing to assure a uniform distribution of eggs on the conveyor to the washer and candler. Spools out of adjustment on these conveyor systems can cause intermittent flow of eggs and increase shell damage. Full belts aid operational efficiency through the full utilization of equipment such as the washer, producing economic benefits as a result of shorter running times for equipment. Efficiency of the egg candler is enhanced by a full flow of eggs. Light shining from beneath the

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conveyor spools (where there are no eggs) directly into the eyes of the candler can impair vision, making accurate quality assessment of the eggs difficult.

Areas where eggs accumulate or change direction are potential areas for shell damage and should be kept to a minimum with equipment in adjustment. Belt regulation during processing is imperative. Improper regulation results in a pile-up of eggs with subsequent shell damage, as well as overloading of equipment. This results in more downtime with an accompanying increase in the processing cost. Proper adjustment of scales, packer orienter and the egg packer is essential since damage during these phases will not be detected for removal by candler. Such damage may result in a "stop sale" order by regulatory inspectors.

Egg protection during distribution may be influenced by the type of egg carton and egg case used. Six types of cartons (three molded pulp, three plastic foam) and three types of cases (15-dozen wire, 24-dozen wire, 30-dozen cardboard) were evaluated for protection against a vertical drop. Results generally indicated that molded pulp cartons offered more protection than plastic foam cartons. This was because of

the strong center support posts in two of the molded pulp cartons.

Results of case type comparisons for egg shell damage indicated that the 30-dozen cardboard case offered the greatest protection against damage by vertical drop, while the 24-dozen wire case offered the least protection. This was because of the cushioning effect of the cardboard case as opposed to the rigid wire case construction with no cushion effect. The best results were obtained with molded pulp cartons combined with cardboard cases, however, the combination of pulp cartons with wire cases minimized shell damage in the wire cases to some extent.

Your Quality Control Program

Egg quality maintenance through processing and distribution requires the active attention of personnel at all stages. An effective quality control program does not have to be large or costly, as a small, efficiently organized program can serve the same purpose at a much lower cost. Such a program will insure a high quality final product to the consumer, and more than pay for itself in increased economic returns to the marketer.

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