

Egg Processing by Hand *By Anne Fanatico, ATTRA*

Cleaning:

A slightly dirty egg can be brushed off or rubbed with sandpaper. Loofahs and sanding sponges are also used. Eggs can be cleaned by hand by immersion in water. Dirty eggs can be rinsed in water that is slightly warmer than the egg (cooler water may force bacteria through the shell into the egg). The USDA's Egg-Grading Manual (1) recommends that wash water be at least 20° F warmer than the eggs and the water should be at least 90° F. Some producers use commercial dishwashing powder and bleach (a traditional food service sanitizer). Eggs are generally put on dish racks to dry. Producers usually wash and process eggs by hand in a kitchen setting. Clean eggs stored at 45°F and 70% humidity will keep for 3 months. In a standard refrigerator, where the humidity is lower, a washed egg keeps for 5 weeks. Producers usually use cracked eggs for baking.

It is important to note that washing eggs washes off the cuticle or "bloom" – a waxy layer that seals the pores and keeps out bacteria. Older egg production books do not recommend washing eggs at all. It was important in the past not to remove the cuticle since refrigeration was not always possible. Washed eggs always had to be consumed immediately. Many small-scale producers and the conventional egg industry now remove the cuticle. Cleaned eggs can be dipped in a solution of water and chlorine bleach to sanitize them. It may depend on your state authorities whether washing requires a follow-up chlorine rinse. Some producers use a plastic watering can and bleach and water mixture. The conventional egg industry often sprays on a mineral oil to re-seal the pores and keep out bacteria.

Candling:

Eggs may be required to be candled when sold commercially in the U.S. to ensure interior quality of the eggs (i.e. no blood spots, cracks, etc.); however, small operations may be exempt from USDA regulations. Even if you are exempt, candling may still be important to ensure your customers do not unknowingly receive fertile eggs with developing embryos, eggs with blood spots, or cracked eggs. If you gather frequently and use cold storage, embryos will not have the chance to develop in fertile eggs. According to one producer:

Candling is essentially a joke, except as a way to test for cracks. If you follow the rule of "never sell an egg that you collected from somewhere you didn't look yesterday," there's not much point to candling. I never see anything interesting when candling, except for cracks (2).

If you plan to hand candle, there are many different setups that might be useful. Murray McMurray (3) sells a hand candler in their catalog. Kuhl Corporation (4) has a hand candler. Brown eggs are more difficult to candle and may require a more expensive model.

According to Colorado State Extension, "a suitable light can be handmade by cutting a 1- ¼ inch diameter hole in the end of a coffee can. Insert a light bulb fixture through the lid, using a 40-watt bulb. View the interior of the egg by holding the large end up to the hole cut in the bottom

of the can. As the light passes through the egg, twirl the egg several times. If blood spots are present, you will see them (5)." Another low-tech way to candle: tape a 3-inch length of empty toilet paper tube to a flashlight.

Candling is an important technique in hatching eggs to determine embryo development.

The USDA grades eggs for quality. Quality is based on shell quality, the air cell, the white and the yolk. For example, the highest quality AA has a clean, unbroken, unstained shell; the air cell is 1/8 inch or less in depth, the white is clear and firm, the outline of the yolk is only slightly defined and free from defects such as blood spots.

The term "grading" is also used when putting eggs into various classifications depending on their sizes (peewee, small, medium, large, extra large, jumbo). Refer to source of weights. Many producers do not grade but mark them as mixed or unclassified.

Egg processing by machine:

When your operation gets larger, you may decide to use machinery to help automate egg processing. While there is a lot of information on large-scale egg processing equipment for the conventional egg industry, there is little information on intermediate-scale processing.

Immersion washing:

According to Oregon egg producer Robert Plamondon (6), "washing is a complete pain when done by hand."

There are small-scale immersion washers on the market. Plamondon describes the KlenEgg washer from NASCO (7) and the Kuhl (4) washer. Pictures of the products are available on the Internet sites. The KlenEgg is essentially a galvanized bucket big enough for an egg basket with a heating element to keep the water warm and a tube with holes in it at the bottom. You hook the tube up to an air compressor and "you've got yourself an egg Jacuzzi." The air compressor blows bubbles into the water, agitating it and cleaning the eggs. "With a suitably small compressor, this would work fine in the kitchen." It costs about \$250, is "ugly and jury-rigged," but works pretty well. The heating element is a 115V, 1500-watt element. You can fill it with hot water from the kitchen sink, and it is small enough to pick up and dump used water. In fact, for kitchen use, Plamondon does not recommend plugging in the heating element – "by the time the water's cold, it's probably also dirty (2, 8)."

Another popular immersion washer is from Kuhl (4). It sits on casters, and uses an electric motor and a plastic propeller as the agitator. It costs about \$900. Since it is heavy and drains out the bottom, it is not suitable for use in the kitchen, but rather for places with floor drains. According to Plamondon, it doesn't get the eggs any cleaner than the KlenEgg but costs over 3 times as much. It has a heating element that you can get in 115V or 240V. Plamondon has used his Kuhl washer as a scalding as well (2, 8).

Immersion washers have a bad reputation because there's always the temptation to run one more basket through when you should really stop and change the water. The rule of thumb is that you should wash no more than 3 dozen eggs per gallon of wash water (8).

There used to be a lot of makes of farm-flock egg washers, mostly immersion washers. They'll date back to the 1940s and 1950s, but my experience is that machines from this era tend to run forever. Look for oiling points and put some 3-in-1 oil there, and replace the power cord, since the original is sure to have cracked insulation, and it'll probably run for a lifetime. There must be tens of thousands of these in barns and sheds on old farms (8).

New egg washing equipment is available from Murray McMurray (3) for about \$1000. Legality of immersion washers is questionable in some states; however, as mentioned before, a sanitizing rinse with bleach may be used.

Non-immersion washing:

Other types of washers use brushes instead of immersion to clean. Plamondon has distributed information about the AquaMagic washer/sanitizer/ drier, which also has attachments to candle and grade. "Because it uses brushes and water to clean the eggs instead of water alone, it cleans them a lot more effectively." Plamondon has a picture of an AquaMagic on his website at www.plamondon.com. It comes in 2 models: the model 10 (formerly called the model 60) and the smaller model 5. These are large machines – the Model 10 is 16 feet long and 2 feet wide. The Model 5 is 7 feet long. They are available from the National Poultry Equipment Company (9) and have been made for at least 40 years. It takes 240V at 20 amps plus a water and drain hookup. It has its own water heater.

The AquaMagic candles, washes (with a water spray and brushes), dries (with fans and more brushes). The washer section works MUCH better than immersion washers, and the drier section means you don't have to leave eggs sitting around to dry. The washer comes with a little pump that pumps detergent/sanitizer solution out of a bucket and mixes it with the warm wash water. It comes with a chute loader, which is a ramp that you fill up with a row of eggs. They roll slowly down the ramp as the washer picks the eggs up one at a time. The washed/sanitized/dried eggs come out the far end onto a table, where you pick them up and put them into flats or cartons. For a little extra, you can have a candling light added the chute loader, where a bright light shines up through a slot in the chute, allowing you to candle the eggs as they pass by.

Plamondon suggests buying the small unit and requesting the water heater to be omitted. He says the water heater is a very fancy unit, capable of an unnecessary amount of temperature regulation (down to one degree). Just hook the unit up to an existing source of hot water. With the savings, you can have the candler light added to the chute loader (about \$700) and still have some for shipping. The total would be slightly over \$6000.

Plamondon points out that although this machinery is expensive, it can last a long time since there are few parts to break down. In fact, used units that would still operate well may be found stored in old barns. Parts are still available for these old machines, since many core parts

have remained interchangeable over the decades. However, "you'll want to think twice about buying an old unit in dubious operating condition if you aren't mechanically inclined."
Plamondon bought his large used unit for \$50!

References:

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www.plamondon.com
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