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## MITIGATING FOOD LOSS AND WASTE

ARS research reduces food loss and waste and transforms food waste into new marketable products for consumers. The USDA Economic Research Service determined that annually 31 percent of the 430 billion pounds of U.S. food supplies at retail and consumer levels goes uneaten and is otherwise wasted. In 2015, USDA joined with the U.S. Environmental Protection Agency to set a goal for the Nation to cut its food loss and waste by 50 percent by the year 2030. The following FY 2019 accomplishments illustrate ARS efforts to achieve this goal.



**New freezing technology retains fresh-like fruit quality when thawed.** ARS scientists in Albany, California, and colleagues at the University of California-Berkeley discovered that the isochoric method of freezing—first developed to preserve human organs for transplanting—can result in thawed sweet cherries that are indistinguishable from fresh cherries in terms of juice loss, texture, structure, ascorbic acid content, and antioxidant activity. This method uses 70 percent less energy compared with conventional freezing methods and promises to revolutionize the \$54 billion U.S. frozen foods market.

**New, automated in-field apple sorting machine.** ARS scientists in East Lansing, Michigan, designed and constructed an automated in-field apple sorting system that separates low-quality from high-quality fruit at harvest, which increases harvesting efficiency and reduces food loss. This system can sort 11 or more apples per second with 100 percent sorting accuracy, superior grading repeatability, and no bruising damage. Schwallier's Country Basket, a commercial orchard, is testing the sorting system.

**New fruit storage clamshell container with superior freshness retention.** ARS scientists in Fort Pierce, Florida, designed a new clamshell container for fresh-fruit storage that maintains optimum humidity and prevents fruit weight loss in storage. The new container maintains firmness of sweet cherries and freshness of litchis, strawberries, blueberries, bayberries, apricots, loquats, and cherry tomatoes.

**New commercial control strategies to combat apple superficial scald.** Superficial scald is an apple peel browning disorder that occurs after postharvest chilling and contributes to fruit quality losses in markets where scald control compounds are restricted. ARS scientists in Wenatchee, Washington, demonstrated that chilling injury is preventable by postharvest hot water treatment or by exposing apples to low oxygen, high carbon dioxide storage atmospheres within 7 days after harvest. These nonchemical control measures reduce losses for apple producers, distributors, and retailers in markets where no consistent superficial scald mitigation strategy previously existed.



**Tough yet flavorful 'Keepsake' strawberry cultivar.** ARS researchers in Beltsville, Maryland, released and patented 'Keepsake', a mid-season strawberry producing fewer rotted or degraded fruits in the field or after refrigerated storage. The fruits are very sweet with outstanding flavor and are firm and tough enough for commercial handling. Nine U.S. and Canadian nurseries now have 'Keepsake' for propagation and licensing for sale. Nursery and grower demand for 'Keepsake' already exceeds supply.