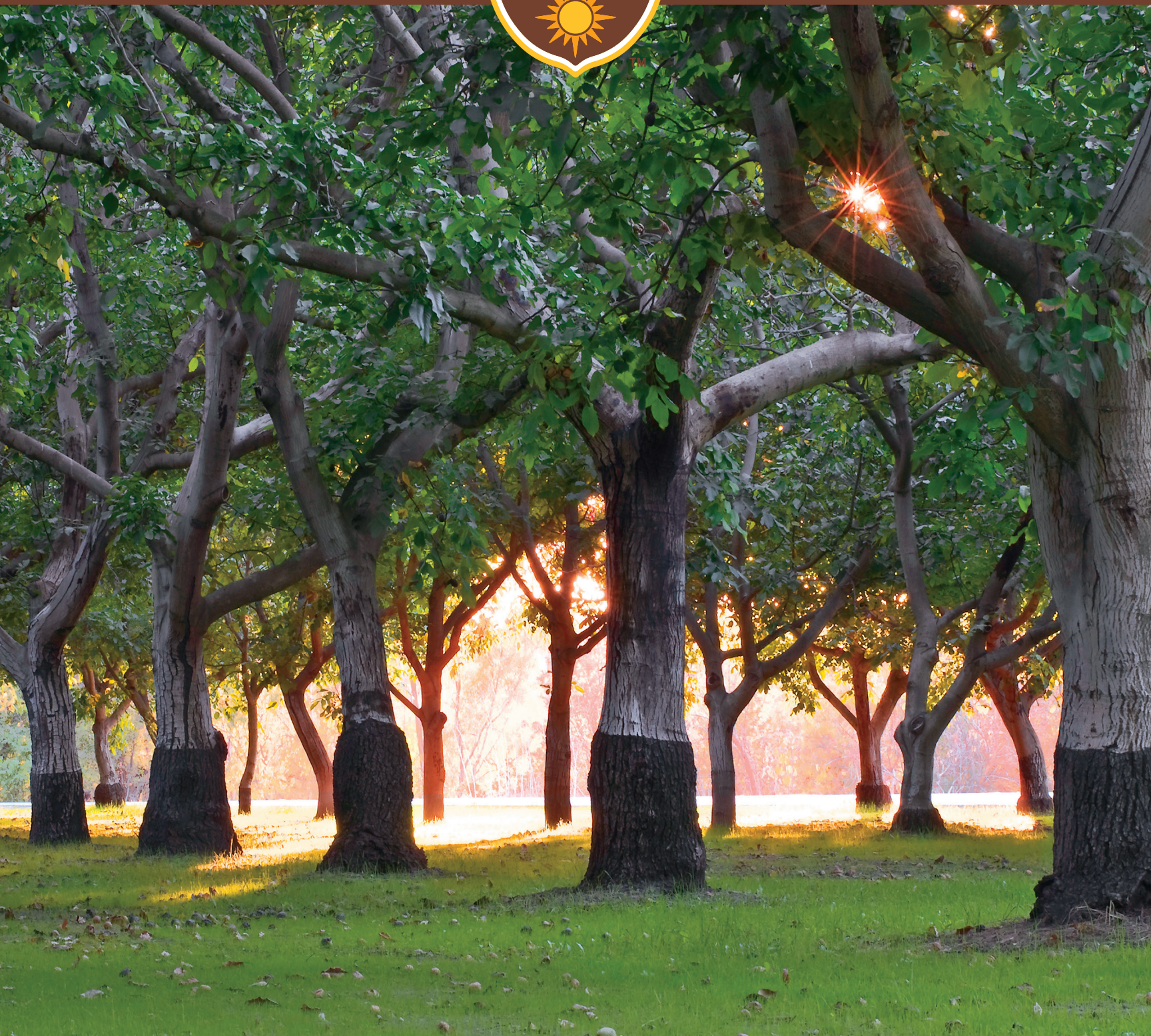


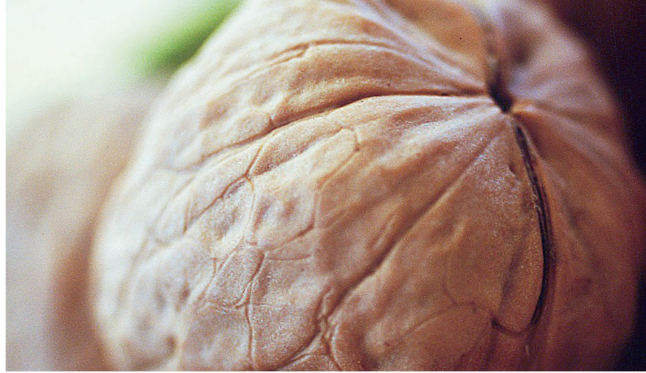
CALIFORNIA WALNUTS
INDUSTRY OVERVIEW





CALIFORNIA WALNUT BOARD AND CALIFORNIA WALNUT COMMISSION
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W A L N U T S . O R G



WALNUT HISTORY

THE ROYAL NUT



Walnuts, the oldest tree food known to man, have a rich history dating back thousands of years. The Romans called walnuts *Juglans*

regia, “Jupiter’s royal acorn.” Early history indicates that English walnuts came from ancient Persia, where they were reserved for royalty. Thus, the walnut is often known as the “Persian Walnut.”

Walnuts were traded along the Silk Road route between Asia and the Middle East. Caravans carried walnuts to far-off lands and eventually through sea trade, spreading the global popularity of the walnut. English merchant marines transported the product for trade to ports around the world. Even though England never grew walnuts commercially, they became known as “English Walnuts.”

Today the nut trade continues to be a well-established, ordered, and structured business, and the California walnut is well known as a delicious, top-quality nut worldwide.

CALIFORNIA ORIGIN

The walnut was first cultivated in California by the Franciscan fathers in the late 1700s. Unlike today’s walnuts, these early varieties, known as “mission walnuts,” were small with hard shells. The trees flourished in the Mediterranean-like climate zones of California.

CALIFORNIA WALNUT INDUSTRY

The first commercial plantings began in 1867 when Joseph Sexton, an orchardist and nurseryman in the Santa Barbara County town of Goleta, planted English walnuts.

For several years, walnuts were predominantly planted in the southern areas of California. Luther Burbank is credited with early research in California walnut cultivation, and many of today’s improved cultivars are descendants of these early plantings.

Some 70 years after Sexton’s first planting, the center of California walnut production moved northward to the Central Valley area in one of the most dramatic horticultural moves in history. Better growing areas, improved irrigation, and better pest control methods in the north resulted in greater yields, which gradually increased each year.



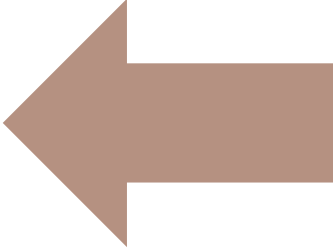
Storage

To extend walnuts’ shelf life and maintain their fresh, distinctive flavor, store the nuts at low moisture (55% to 65% relative humidity), and low temperature (38°-45°F) in an odor-free environment. Walnuts keep best away from moisture and light in a refrigerator or freezer in tightly sealed containers or plastic bags.

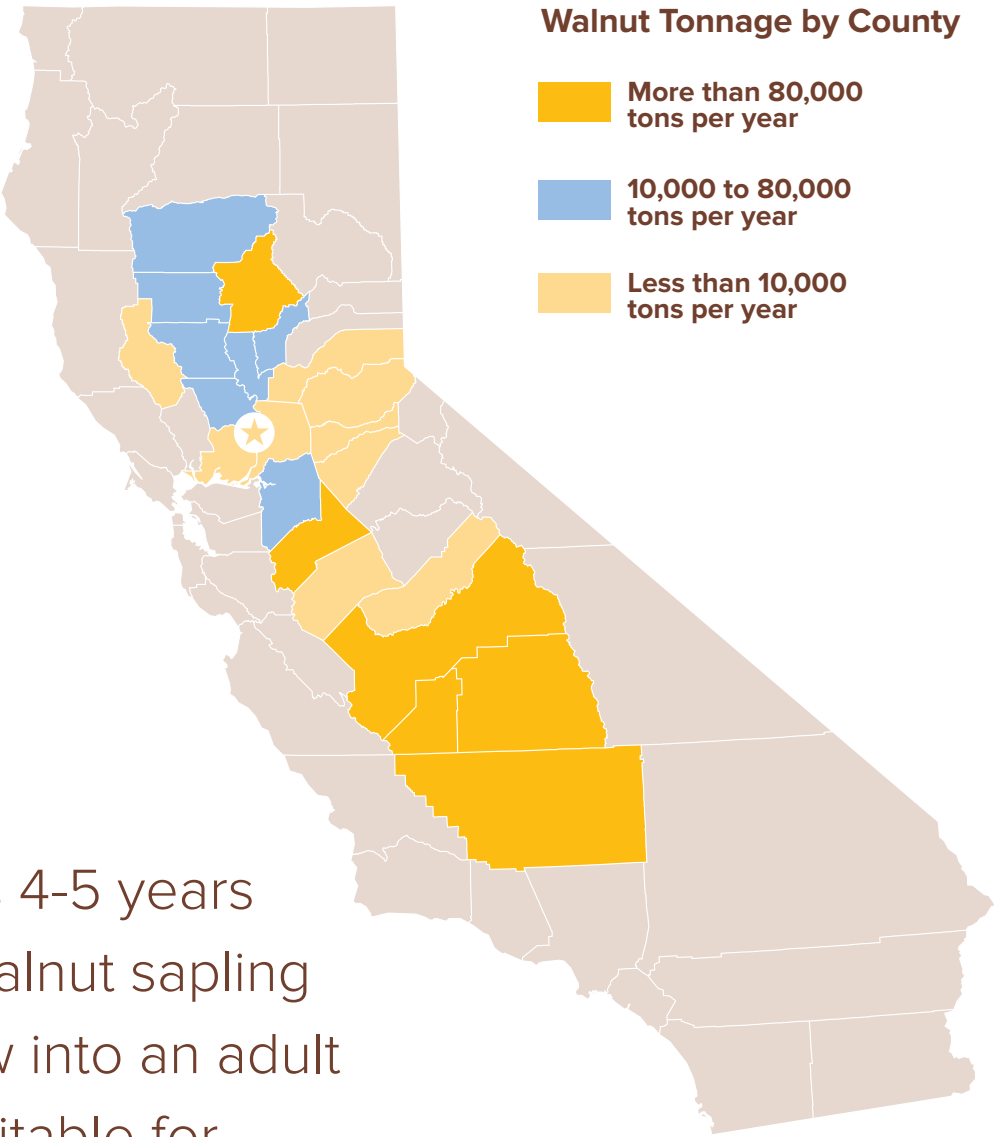


WHERE DO CALIFORNIA WALNUTS COME FROM?

- ▶ More than 99% of walnuts grown in the United States come from California's 335,000 bearing acres of walnut orchards.
- ▶ The Central Valley of California is the state's prime walnut growing region, with a mild climate and deep fertile soils that provide ideal growing conditions.
- ▶ There are more than 4,000 California walnut growers, and most farms are owned and operated by families who have been in the walnut business for several generations. Walnut production takes commitment and patience, and our farmers are passionate about growing and harvesting high-quality walnuts.



WHERE ARE WALNUTS GROWN?



ORIGIN + GROWING

It takes 4-5 years for a walnut sapling to grow into an adult tree suitable for harvesting

THE WALNUT HARVEST

The harvest begins in early September, when the outer green hulls start to split, and continues through mid-November.



Step 1

Mechanical shakers vigorously shake each tree and thousands of walnuts fall to the ground.

Step 2

The walnuts are then carefully swept into rows to allow mechanical harvesters to pick them up for cleaning.

Step 3

Once walnuts are harvested, a huller removes the outer green husk and then the walnuts are washed and dried to protect quality during storage.



Step 4

After the huller and dryer, walnuts are transported to the packing plant where they are graded based on usage, in-shell or shelled.

Step 5

Shelled walnuts are mechanically cracked and further graded by color before kernels are screened and separated into different sizes according to USDA standards.

Step 6

Finally, the walnuts are inspected and hand-sorted by trained sorters to ensure they are clean, and of specified color.

At the end of this process, the walnuts are either shipped or stored until needed.

BEST PRACTICES

Walnut growers set the stage for producing a safe, wholesome product by following established “Best Practices” in the orchards known as Good Agricultural Practices (GAPs), which comply with the Produce Safety regulations under the Food Safety Modernization Act (FSMA).

Similarly, throughout the shelling process, Good Manufacturing Practices (GMPs) rules established by the FDA under FSMA Preventive Controls are stringently followed. Specifically, shelled walnuts are subjected to rigorous quality control inspections by each handler and tested again by the DFA of California. Once the kernels pass inspections, each lot number is certified to be in compliance to established USDA Standards. These practices ensure walnuts are produced under the cleanest manufacturing conditions.



SUSTAINABILITY

Sustainability is important to the California walnut industry and the California Walnut Board has supported these growing practices throughout its production research program for over 20 years. The California Walnut Sustainable Program focuses on integrated pest management, energy efficiency, water quality, air quality, nutrient efficiency, and food safety. The program is economically viable for walnut growers, follows environmentally responsible practices and is socially acceptable by improving the quality of life for growers, neighbors, and consumers. The California Walnut Board is committed to investing in research that will help the industry continue to raise the bar for sustainability.

WALNUT BREEDING

In 2016 the California Walnut Board recognized the 21st anniversary of the California Walnut Breeding Research Fund endowment, which was established in 1995 to assure the continuity of the Walnut Breeding Program at UC Davis.

While the endowment was established in 1995, the California

Walnut Board’s partnership with the walnut breeding program has been in place since the 1970s resulting in the release of numerous new walnut varieties. These varieties have been developed through conventional breeding methods for nut quality, high yield and optimal disease resistance. None have been genetically modified.

Long-standing research partnerships such as this are critical to advancing our understanding of walnuts to allow for the development and release of new varieties that will not only thrive in California, but will help to meet growing demand.



HEART-CHECK CERTIFIED

California walnuts are proud to be Heart-Check* certified by the American Heart Association.

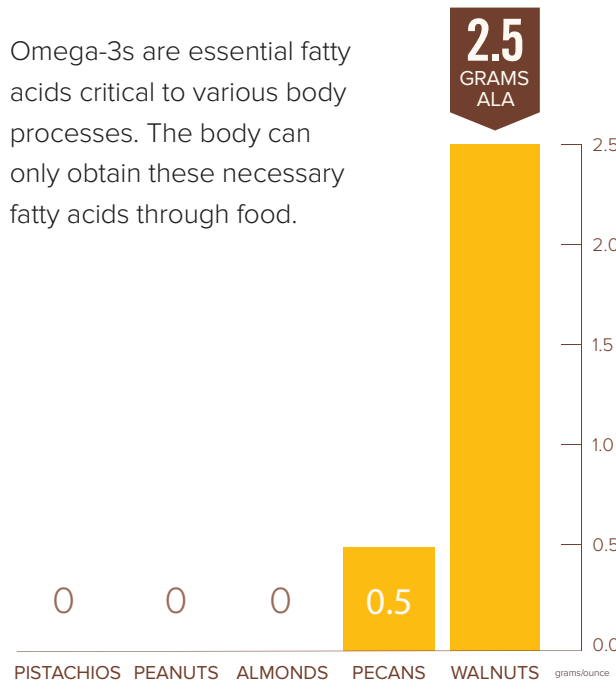
69% of a nationally representative sample of Women 18+¹ said they would be more likely to buy walnuts after seeing the American Heart Association certification.

DIETARY GUIDANCE

The 2015 Dietary Guidelines encourage a shift from current eating patterns to a healthy eating pattern that includes nutrient-dense foods and beverages in place of less nutritious choices.² Among other things, a healthy eating pattern includes a variety of protein foods, including nuts and seeds along with seafood, lean meats and poultry, eggs, legumes and soy products.

WALNUTS are the **ONLY NUT** that contains a significant amount of plant-based omega-3 ALAs

Omega-3s are essential fatty acids critical to various body processes. The body can only obtain these necessary fatty acids through food.



USDA Natural Nutrient Database for Standard References, Release 28. Version Current: September 2015, slightly revised May 2016.

* Heart-Check food certification does not apply to recipes unless expressly stated. See heartcheckmark.org/guidelines.

¹ California Walnuts Advertising Tracking Study, Rose Research 2016

² U.S. Department of Health and Human Services and U.S. Department of Agriculture. 2015-2020 Dietary Guidelines for Americans. 8th Edition. December 2015. Available at <http://health.gov/dietaryguidelines/2015/guidelines/>

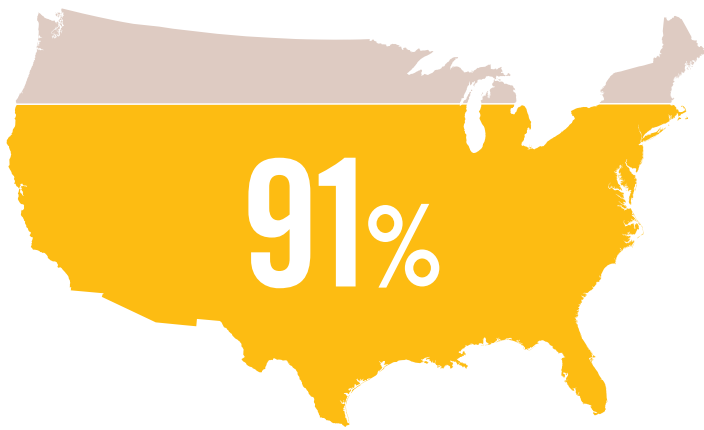
Nutrition Facts

Serving size	1 ounce (28g)
Amount per serving	
Calories	190
	% Daily Value*
Total Fat 18g	23%
Saturated Fat 1.5g	8%
<i>Trans</i> Fat 0g	
Polyunsaturated Fat 13g	
Monounsaturated Fat 2.5g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 4g	1%
Dietary Fiber 2g	7%
Total Sugars 1g	
Includes 0g Added Sugars	0%
Protein 4g	
Vitamin D 0mcg	0%
Calcium 28mg	2%
Iron 1mg	6%
Potassium 125mg	2%

*The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

US Department of Agriculture, Agricultural Research Service, Nutrient Data Laboratory. USDA National Nutrition Database for Standard Reference, Release 28. Version Current: September 2015, slightly revised May 2016.

NUTRITION



91% of U.S. consumers think walnuts are nutritious¹ and nutrition research has contributed to the evolving understanding of the health benefits of walnuts.

HEALTH RESEARCH

Global consumer trends² indicate:

- Consumers are going back to basics
- The most desirable attributes are foods that are fresh and natural
- 80% are using foods to forestall health issues and medical conditions such as obesity, diabetes, high cholesterol and hypertension

Since 1990, the California Walnut Commission has invested over \$15 million for nutrition research:

- 25 years of scientific research
- 120+ published papers
- 52 institutions
- 9 countries (USA, Spain, Germany, UK, Israel, Japan, China, South Korea, Australia)

40+

CURRENT PROJECTS

The areas of interest for emerging science include:

- ▶ **Weight**
- ▶ **Cognitive Health**
- ▶ **Heart Health**
- ▶ **Cancer Prevention**
- ▶ **Diabetes**

¹ Rose Research Attitude & Usage Study 2013

² The Nielsen Company 2015 We Are What We Eat: Healthy Eating Trends Around the World. Accessed at www.nielsen.com



SIZE & COLOR

EXAMPLES



Example #1 Light



Example #2 Light



Example #3 Light/Light Amber



Example #4 Light



Example #5 Light/Light Amber



Example #6 Light



Example #7 Light/Light Amber



Example #8 Light



Example #9



Example #10 Diced



Example #11



Example #12 Diced



Example #13



Example #14



Example #15

SIZE & COLOR

CHARTS AND INFORMATION

WALNUT SIZES

California shelled walnuts are available in a variety of sizes and colors. Descriptions and size tolerances are based on the USDA Standards for Grades of Shelled Walnuts. These are highlighted in **yellow** text. Also included are some size categories commonly used in the industry and these are highlighted with **orange** text. Screen sizes are for reference only. Consult your California walnut supplier for exact specifications.

HALVES

Description: Lot consists of 85% or more (by weight) of half kernels, with the remainder three-fourths of a half kernel.

USDA Size Tolerances: No more than 5% can be smaller than three-fourths of a half kernel. No more than 1% of the 5% may pass through a $\frac{1}{64}$ inch (6.35 mm) screen. *See Table 3 and refer to Example 1*

PIECES AND HALVES

Description: Lot consists of 20% or more (by weight) of half kernels.

USDA Size Tolerances: No more than 18% shall pass through a $\frac{2}{64}$ inch (9.53 mm) screen. No more than 3% of the 18% may pass through a $\frac{1}{64}$ inch (6.35 mm) screen. And no more than 1% of the 3% pass may through an $\frac{3}{64}$ inch (3.18 mm) screen. *See Table 3 and refer to Examples 2 and 3*

PIECES

Description: Lot consists of kernel portions that cannot pass through a $\frac{2}{64}$ inch (9.53 mm) screen.

USDA Size Tolerances: No more than 25% shall pass through a $\frac{2}{64}$ inch (9.53 mm) screen. No more than 5% of the 25% may pass through a $\frac{1}{64}$ inch (6.35 mm) screen. No more than 1% of the 5% may pass through a $\frac{3}{64}$ inch (3.18 mm) screen. *See Table 3 and refer to Examples 4, 5, 6 and 7*

MEDIUM PIECES

Although not covered in USDA Standards, Medium Pieces are a common size classification used in the California walnut industry. No less than 98% may pass through a $\frac{3}{64}$ inch (12.7 mm) screen. No more than 3% of that 98% may pass through a $\frac{1}{64}$ inch (6.35 mm) screen. And no more than 1% of the 3% may pass through $\frac{3}{64}$ (3.18 mm) screen. *Refer to Examples 8 and 9*

SMALL PIECES

Description: Lot consists of kernel portions that pass through a $\frac{2}{64}$ inch (9.53 mm) screen, but cannot pass through a $\frac{3}{64}$ inch (3.18 mm) screen.

USDA Size Tolerances: No more than 10% will not pass through a $\frac{2}{64}$ inch (9.53 mm) screen. No more than 2% pass of the 10% may pass through a $\frac{3}{64}$ inch (3.18 mm) screen. *See Table 3 and refer to Example 11, 12, and 14*

MEAL/DOUBLE DICED

The smallest form of the California walnut (Double Diced), comes in various consistencies ranging from a coarse meal to a fine powder. Walnut meal is used to dust cakes, integrate into dough and batter, and for walnut compounds. Finely ground walnuts can be incorporated into pastas, added to fillings, and used as a thickening agent in sauces. *Refer to Example 15*

TOPPING PIECES

SQUARE HOLE	ROUND HOLE
1/4 6.35 mm	20/64 7.94 mm

Typical industry Screen Sizes *Refer to Example 13 and 14*

SYRUPERS

SQUARE HOLE	ROUND HOLE
3/8 9.53 mm	28/64 11.11 mm

Typical industry Screen Sizes *Refer to Example 10*

WALNUT COLORS

California walnuts may be color sorted to meet specific product needs. The walnut spectrum chart (for comparison only) illustrates the wide range of color classifications available.



Extra Light: No more than 15% shall be darker than extra light. And only 2% of the 15% may be darker than light.



Light: No more than 15% shall be darker than light. And only 2% of the 15% may be darker than light amber.



Light Amber: No more than 15% shall be darker than light amber. And only 2% of the 15% may be darker than amber.



Amber: No more than 10% shall be darker than amber.



Red

The official color chart is available from: **DFA** 710 Striker Avenue, Sacramento, CA 95834-1112
Tel: 916-561-5900 Fax: 916-561-5906 www.dfaofcalifornia.com

TABLE 3 (USDA STANDARDS)					
Size Classification	Tolerance for Size				
	Smaller than 3/4 halves	Will not pass through 2 3/64" round hole	Pass through 2 3/64" round hole	Pass through 1 9/64" round hole	Pass through 9/64" round hole
Halves	5%			1% (included in 5%)	
Pieces and Halves*			18%	3% (included in 18%)	1% (included in 3%)
Pieces			25%	5% (included in 25%)	1% (included in 5%)
Small Pieces**		10%			2%

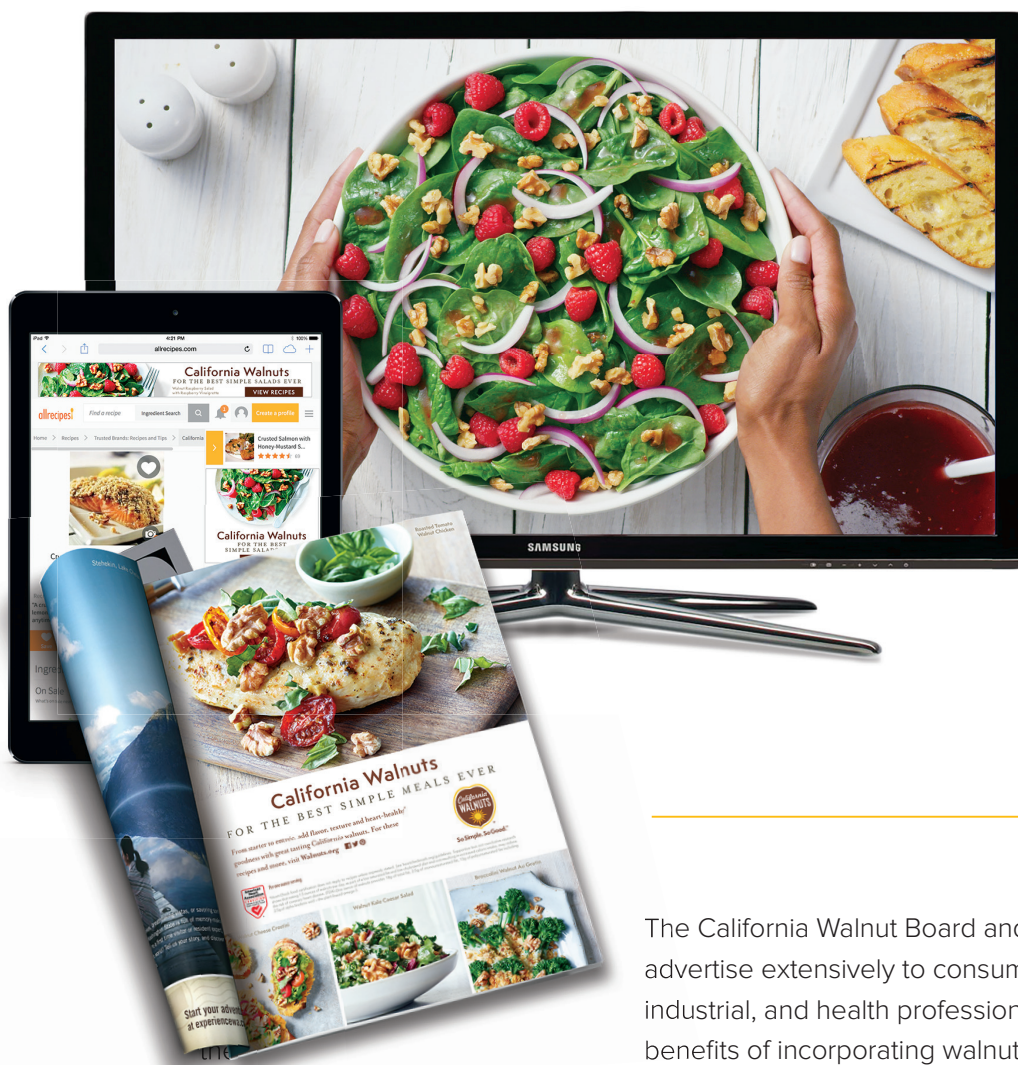
*No part of any tolerance shall be used to reduce the percentage of halves required or specified in a lot of "pieces and halves"

**The tolerance of 10% and 2% for "small pieces" classification shall apply, respectively, to any smaller maximum or any larger minimum sizes specified.

Note: The industry standard of 9/64 is tighter than the USDA standard of 9/64.

Source: USDA, United States Standards for Grades of Shelled Walnuts (*Juglans regia*). Agricultural Marketing Service. Effective September 21, 2017. https://www.ams.usda.gov/sites/default/files/media/Shelled_Walnut_Standard%5B1%5D.pdf (Adobe Acrobat format).

MARKETING + ADVERTISING PROGRAMS

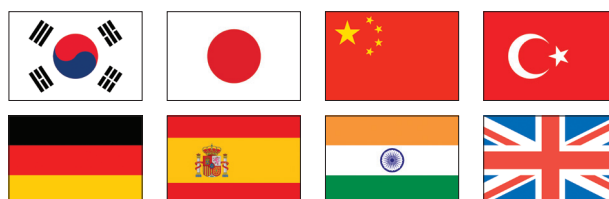


The California Walnut Board and Commission market advertise extensively to consumers, foodservice, industrial, and health professionals to communicate benefits of incorporating walnuts into daily diets.

National TV advertising focuses on California walnuts as a versatile, heart-healthy* and delicious ingredient in easy-to-prepare recipes. Impactful print and digital ads showcase even more usage suggestions in 13 top-selling cooking and women's service publications. These programs are supported with far-reaching public relations activities, plus a website and social media campaign that distributes hundreds of recipes and reaches more than 1.2 million consumers each month. The result? The 2017 Attitude and Usage Study shows growing awareness and positive attitudes towards California walnuts among consumers.

The California Walnut Commission is also active in Europe, the Middle East and Asia, expanding awareness of the health benefits of walnuts and building exports to countries including Spain, Germany, UK, Turkey, China, Japan, Korea, and India.

* Supportive but not conclusive research shows that eating 1.5 ounces of walnuts per day, as part of a low saturated fat and low cholesterol diet and not resulting in increased calorie intake, may reduce the risk of coronary heart disease. (FDA) One ounce of walnuts provides 18g of total fat, 2.5g of monounsaturated fat, 13g of polyunsaturated fat including 2.5g of alpha-linolenic acid - the plant-based omega-3 - and has 4g of protein and 2g of fiber.





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