



California Walnuts

FOR PRODUCT DEVELOPERS



Why California Walnuts?



CALIFORNIA'S HIGH GROWING AND HANDLING STANDARDS DIFFERENTIATE CALIFORNIA WALNUTS FROM WALNUTS GROWN ELSEWHERE. CALIFORNIA'S CENTRAL VALLEY REGION'S IDEAL GROWING CONDITIONS OFFER QUALITY WALNUTS.



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THE CALIFORNIA WALNUT INDUSTRY

The Central Valley of California is home to over 220,000 acres of walnut orchards, which account for 99% of U.S. production. The California walnut industry is made up of more than 4,000 growers and 81 handlers (processors) whose walnuts are shipped to more than 40 countries and represent three-quarters of world trade.

The first commercial walnut plantings began in 1867 when Joseph Sexton, an orchardist and nurseryman in the Santa Barbara County town of Goleta, planted English walnuts. Soon, walnuts were planted in many areas of southern California and accounted for 65% of all bearing acreage.

Some 70 years later, the center of California's walnut production moved northward in one of the most dramatic horticultural moves in history. Better growing areas, along with improvements in irrigation resulted in greater yields, which gradually increased each year. Today, the Central Valley of California is the state's prime walnut growing region.

TASTE

Walnuts from California are light in color and have a sweet mild taste that makes savory sweet, and sweet savory.

VALUE

Walnuts are a nutrient-rich 'superfood' and add value that consumers will recognize and appreciate. As a topping in a salad, or as an ingredient in a sauce or in an oatmeal cookie, California walnuts raise the customer's perception of value without substantially raising food costs.

VERSATILITY

The mild flavor and soft texture of walnuts make them a versatile ingredient for flavor profiles in recipes and processed products.

NUTRITION

Walnuts are the only nut with a significant amount (2.57 grams/ounce) of alpha linolenic acid (ALA), an omega-3 fatty acid. Consumers are aware of the benefits of omega-3s. Offer your customers the value-added benefits of omega-3s, powerful antioxidants, and plant-based protein, with just a handful of walnuts in their favorite foods.



HARVESTING, PROCESSING & GRADING

NUTRITION INFORMATION



GROWING

Walnut production takes commitment and patience, and orchards are dedicated solely to walnut production. After a walnut sapling is planted, it takes five to seven years for it to grow into an adult tree suitable for harvesting. A walnut tree can bear fruit for 100 years. Although many varieties of walnuts are grown in California, four account for more than 80% of total production: Chandler, Howard, Hartley and Tulare.

HARVESTING

Harvesting begins in late August and continues through November. The walnuts are ready for harvest when the outer green hulls begin to dry and split, allowing the in-shell walnuts to be removed. Mechanical shakers vigorously shake each tree and thousands of walnuts fall to the ground. The walnuts are carefully swept into windrows (rows of walnuts raked into heaps) to allow mechanical harvesters to pick them up for cleaning.

PROCESSING – HULLING

Once the walnuts are harvested, pre-cleaners are used to clean the walnuts so they are ready for hulling. A huller removes the outer green hull and the nut is mechanically dehydrated (air dried) to the optimum 8.0% moisture level, preventing deterioration of the nut and protecting its quality during storage. Hulled walnuts are transported to nearby packing plants and are stored until needed for cracking.

THE CALIFORNIA WALNUT INDUSTRY HAS EARNED A REPUTATION FOR PRODUCING THE **HIGHEST QUALITY WALNUTS IN THE WORLD** WHILE MAINTAINING AN EXCEPTIONAL FOOD SAFETY RECORD FOR A CENTURY. CALIFORNIA WALNUTS ARE GROWN, HARVESTED, AND PROCESSED FOLLOWING STRICT FEDERAL AND STATE FOOD SAFETY REGULATIONS. OUR FINISHED PRODUCT OFTEN **EXCEEDS QUALITY STANDARDS SET BY THE USDA.**

GRADING

Walnuts are transported to a packing plant where they are graded based on usage, in-shell or shelled. Shelled walnuts are further graded by color, as shown in the official walnut color chart. Walnut kernels are screened and separated into different sizes (refer to Sizes & Colors section on pages 10 through 13).

IN-SHELL WALNUTS – Following drying, sizing of the in-shell nut occurs. In-shell walnuts are sized as jumbo, large, medium, or baby according to USDA standards.

SHELLED WALNUTS – Walnuts are mechanically cracked as needed. The shelled material is air-separated and screened for size and sent to electronic laser-sorting units for kernel color and shell removal. The walnuts are certified to meet USDA grade standards and customer specifications. Product is then packed for shipment to the market place.

Visit www.walnuts.org to learn more about the growing, harvesting and processing of walnuts.

NUTRIENT Per 100g of English Walnut

Calories (kcal)	654
Calories from Fat (kcal)	586.89
Calories from Saturated Fat (kcal)	55.13
Protein (g)	15.23
Carbohydrates (g)	13.71
Dietary Fiber (g)	6.7
Soluble Fiber (g)	2.21
Total Sugars (g)	2.61
Monosaccharides (g)	0.18
Disaccharides (g)	2.43
Other Carbs (g)	4.4
Fat (g)	65.21
Saturated Fat (g)	6.13
Monounsaturated Fat (g)	8.93
Polyunsaturated Fat (g)	47.17
Trans Fat (g)	0
Cholesterol (mg)	0

VITAMINS

Vitamin A - (IU)	20
Vitamin A - (RE)	2
Vitamin A - (RAE)	1
Carotenoid (RE)	2
Retinol (RE)	0
Beta-Carotene (mcg)	12
Vitamin B1 (mg)	0.34
Vitamin B2 (mg)	0.15
Vitamin B3 (mg)	1.12
Vitamin B3 - Niacin Equiv (mg)	3.86
Vitamin B6 (mg)	0.54

NUTRIENT Per 100g of English Walnut

Vitamin B12 (mcg)	0
Choline (mg)	39.2
Biotin (mcg)	19
Vitamin C (mg)	1.3
Vitamin D - (IU)	0
Vitamin D - (mcg)	0
Vitamin E - Alpha-Toco (mg)	0.7
Folate (mcg)	98
Folate, DFE (mcg)	98
Vitamin K (mcg)	2.7
Pantothenic Acid (mg)	0.57

MINERALS

Calcium (mg)	98
Copper (mg)	1.59
Iodine (mcg)	9
Iron (mg)	2.91
Magnesium (mg)	158
Manganese (mg)	3.41
Molybdenum (mcg)	29.5
Phosphorus (mg)	346
Potassium (mg)	441
Selenium (mcg)	4.9
Sodium (mg)	2
Zinc (mg)	3.09

OTHER FATS

Omega 3 Fatty Acid (g)-Alpha Linolenic Acid (ALA)	9.08
Omega 6 Fatty Acid (g)	38.09

Nutritional information was generated using the ESHA Genesis Nutritional Labeling Program.



Health Benefits



Unique among nuts, walnuts contain the highest amount of alpha-linolenic acid (ALA), the plant-based omega-3 fatty acid. In addition to providing 2.5 grams of ALA, an ounce of walnuts provides various antioxidants, protein (4 grams), fiber (2 grams), and is a good source of magnesium (44.79 mg/oz) and phosphorus (98.09 mg/oz).

findings may be attributed to the favorable unique fatty acid and nutritional profile of walnuts providing the plant based omega-3 fatty acid alpha-linolenic acid (ALA), along with numerous bioactive compounds with beneficial effects on Coronary Artery Diseases (CAD) risk, including dietary fiber, folate, and antioxidants.³

WALNUTS AND ANTIOXIDANTS

According to an evidence-based review, antioxidants help to protect from certain chronic diseases of aging, including cardiovascular, neurological and anticarcinogenic ailments due to their ability to control free radicals, known to negatively influence healthy aging.⁴

Walnuts contain several antioxidants including selenium, melatonin, gamma-tocopherol (a form of vitamin E), and several polyphenols. In a 2006 study, 1113 different foods were tested and walnuts ranked second only to blackberries in terms of antioxidant content⁵

A 2012 study⁶ found that the quality and quantity of antioxidants in walnuts ranked higher than any other nut. Researchers compared the amount of powerful antioxidants called polyphenols in nine types of roasted and raw nuts and two types of peanut butter. According to lead researcher Dr. Joseph Vinson, “In addition to providing fiber, high-quality protein and an excellent source of alpha-linolenic acid (ALA), our research shows that an ounce of walnuts has more antioxidants than the daily sum of what the average person gets from fruits and vegetables.”

A TASTY TOOL FOR WEIGHT MANAGEMENT

The good fat (2.5 grams ALA/omega-3 per ounce), fiber (2 grams per ounce) and protein (4 grams per ounce) in walnuts aid in satiety, an important factor in successful weight management. A 2001 Loma Linda University study found that regular walnut consumption did not lead to weight gain in study participants. This small randomized crossover feeding trial included 10 men with hypercholesterolemia. Participants were given one of three diets to follow over a six week period: 1) control, 2) Mediterranean-type cholesterol-lowering diet, and 3) a diet of similar composition in which walnuts replaced 35% of energy from unsaturated fat. After six months the walnut eaters had not gained weight. The walnut diet reduced serum total and LDL (bad) cholesterol by 4.2% and 6.0% respectively. Overall, individuals in this study who substituted walnuts for other calories did not gain weight and showed improvements in cholesterol levels.⁷

BENEFICIAL NUTRIENTS

In addition to antioxidants and essential ALA/omega-3 fatty acid, an ounce of walnuts provides a convenient source of protein and fiber in a naturally cholesterol and sodium free package. Most Americans don't get enough dietary fiber—which promotes healthy bowel function and helps you feel full—a key component in maintaining a healthy weight. Walnuts are also a good source of magnesium (44.79 mg/oz) and phosphorus (98.09 mg/oz)—both important minerals involved in the body's processes and necessary for achieving optimal wellness.

¹ J Nutr. 2004 Nov;134(11):2991-7

² Including Walnuts in a Low-Fat/Modified-Fat Diet Improves HDL Cholesterol-to-Total Cholesterol Ratios in Patients With Type 2 Diabetes. Diabetes Care. 2004 Dec;27(12):2777-83

³ Diabetes Care (October 2009): Effects of Walnut Consumption on Endothelial Function in Type 2 Diabetics: A Randomized, Controlled, Cross-Over Trial

⁴ Functional foods, herbs and nutraceuticals: towards biochemical mechanisms of healthy aging. Biogerontology. 2004;5(5):275-89

⁵ Content of Redox-active Compounds (ie, antioxidants) in Foods Consumed in the United States. Am J Clin Nutr. 2006 Jul;84(1):95-135

⁶ Vinson, JA, Cai, Y. Nuts, especially walnuts, have both antioxidant quantity and efficacy and exhibit significant potential health benefits. Food Funct.,2012; 3;3(2): 134-140

⁷ Walnut-Enriched Diet Increases the Association of LDL from Hypercholesterolemic Men with Human HepG2 cells J Lipid Res. 2001 Dec;42(12):2069-76

California Walnuts are one of the few whole foods that contribute many beneficial nutrients to the diet. For example, walnuts are a source of good polyunsaturated fat (PUFA) which includes essential alpha-linolenic acid (ALA), the plant-based omega-3 fatty acid. One serving of walnuts contains 18 grams of total fat, of which 13 grams are PUFA and 2.5 grams of ALA. To date, clinical research has been conducted in the areas of heart health, diabetes, cognitive function, breast and prostate cancer and bone health. More information on these studies can be found at www.walnuts.org.

SMART FOR THE HEART

Eating a handful of walnuts tastes great, and is a heart-healthy addition to your diet. For over a decade, researchers have shown diverse benefits of this whole food through many clinical studies. Due to the strength of evidence supporting cardiovascular health, the U.S. Food and Drug Administration approved one of the first qualified health claims for a whole food in March of 2004: “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 caloric intake, may reduce the risk of coronary heart disease.”

Chronic internal inflammation is a key component in heart disease. Pennsylvania State University research published in the *Journal of Nutrition*¹ showed that subjects who ate a diet that included walnuts, walnut oil and flaxseed oil daily reduced C-Reactive Protein (CRP) and harmful plaque adhesion molecules, two significant markers of inflammation in arteries. Subjects also exhibited decreased lipid and lipoprotein levels and vascular anti-inflammatory effects.

WALNUTS AND DIABETES

Walnuts can be a nutritious choice for people with diabetes. A study published in 2004 reported the effect of a moderate-fat diet, inclusive of walnuts, on blood lipid profiles in patients with type 2 diabetes. This study included 58 men and women, comparing three groups: 1) low fat, 2) modified low fat, and 3) modified low fat, inclusive of 30g of walnuts (8-10 nuts) per day. The walnut group achieved a 10% reduction in LDL cholesterol and a greater increase in HDL (good) cholesterol levels than the other two treatment groups. The researchers concluded that adding walnuts improved the blood lipid levels of the patients with type 2 diabetes and increased important polyunsaturated fat in the diet.²

Additionally, research, published in the October 2009 issue of *Diabetes Care*, demonstrated that consumption of a diet with approximately two ounces of walnuts per day for eight weeks significantly improved endothelial function in participants with type 2 diabetes. These findings suggest a potential reduction in overall cardiac risk. The researchers concluded these

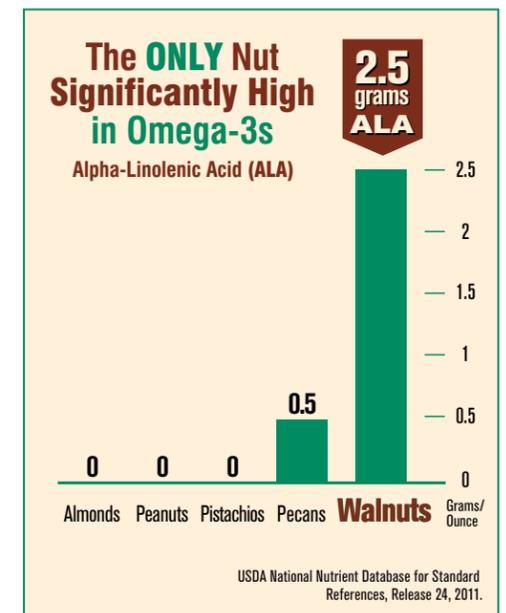


Chart reflects FDA rounding rules. Actual ALA content is 2.57g for walnuts, 0.28g for pecans, 0.07g for pistachios.

CALIFORNIA WALNUTS FOR

Product Developers



FACTS

86% of walnut purchasers believe walnuts are healthy.

61% are buying walnuts more often than 5 years ago.

80% report that they are eating healthier than a couple of years ago.

77% say that they would buy food products with walnuts (up 26% in one year).

63% of the men and women feel that walnuts are “a good value for the money.”

85% say they would buy food products containing walnuts if “heart healthy” was on the package.

84% say they would buy food products containing walnuts if “is a rich source of antioxidants” was on the package.

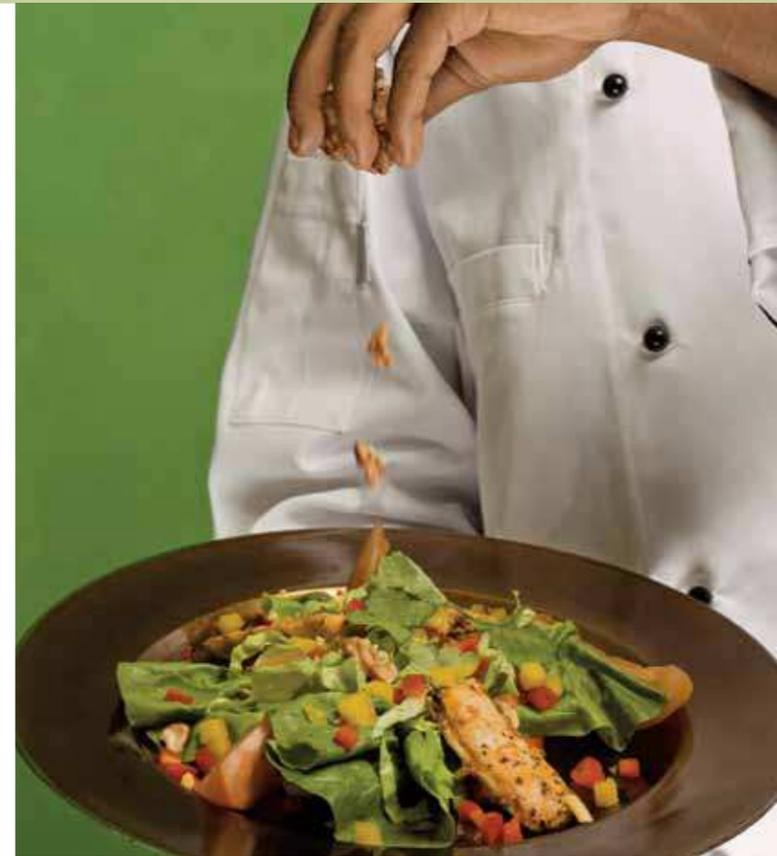
81% say they would buy food products containing walnuts if “contains omega-3 fatty acids” was on the package.

75% say they would buy food products containing walnuts if the package says “contains walnuts.”

Customers want products with walnuts. Highlighting their health benefits on packaging increases purchase intent.



NOW CERTIFIED AS A **HEART-HEALTHY** FOOD BY THE **AMERICAN HEART ASSOCIATION**



TOP CATEGORIES OF PRE-MADE PRODUCTS CONTAINING WALNUTS PURCHASED:

Cookies	54%
Snack Mixes	51%
Cereal	47%
Ice Cream	40%
Baking Mixes	38%
Salad Toppings	33%
Pastries	31%
Bread	30%
Cakes	30%

Rose Research, Attitude & Usage Study, December 2011

Selecting the Right Walnut Form

WALNUT HALVES

Use walnut halves in products that best demonstrate its natural shape and visual appearance. Applications include trail mixes, confectionary, garnishing and decorating baked goods, and whole nut snack mixes.

LARGE PIECES

Use larger walnut pieces in applications where a large nut pieces are desired for texture and appearance. Typical applications include trail mixes, energy bars, frozen dairy inclusions and baked good toppings.

MEDIUM PIECES

Use medium walnut pieces in products where equal flavor and texture is needed throughout the product. Baking mixes, pizza toppings, chocolate based candy bars.

SMALL PIECES

Use small pieces in seasoning blends, baking mixes, breading mixes and frozen dairy toppings. Small pieces work especially well in premixed bakery blends because the small size allows for even distribution throughout the entire mix allowing the nut flavor and texture to come through with every bite.

WALNUT MEAL

Walnut meal can be used to thicken soups and sauces, replace gluten-containing flour, reduce carbohydrate content, increase fiber and help create richer textures. Meal can also be used in seasoning blends and breading mixes.

ROASTED WALNUTS

Roasting walnuts heightens the flavor and aroma while increasing the crunchy mouthfeel. Roasted walnuts work well in applications that will not be further baked such as no-bake energy bars and ready-to-eat snack mixes. The roasted nuts will contribute to the final flavor and texture of these items. For items that will be subjected to further heating (like cakes and muffins) roasted nuts can be used but should be limited to the interior of the baked item and not part of the surface area that will be directly exposed to the heat. Roasted walnuts can be used in wet soup or sauce applications where the moisture in the formula will prevent any subsequent burning from taking place. Roasted nuts are more subject to rancidity and should be packaged in foil (or other thick packaging materials), that will minimize oxygen and light exposure. Shelf life studies will help determine product quality and expiration dates of finished goods.

SUGGESTED WALNUT FORM APPLICATIONS

APPLICATION	HALVES	PIECES	MEDIUM PIECES	SMALL PIECES	MEAL
CONFECTION AND SNACKS					
Chocolate Bars		X	X	X	
Nougat		X	X	X	
Caramelized Nut Mixes	X	X			
Trail Mixes	X	X			
Seasoned Snack Mixes	X	X			
Energy/Cereal/Granola Bars	X	X	X	X	
Breakfast Cereal		X	X	X	
BAKERY					
Baking Mixes			X	X	X
Gluten Free Dough					X
Reduced Carbohydrate Doughs					X
Pie Crust Dough					X
Bread Dough					X
Shortbread Dough					X
Pastry Dough					X
Bread Inclusions		X	X	X	
Cookie Decorations	X	X	X	X	
Sheet Cake Decorating		X	X	X	X
Pastry Filling				X	X
DAIRY					
Frozen Dairy Toppings			X	X	X
Frozen Dairy Inclusions			X	X	
SAVORY					
Pasta Fillings				X	X
Soup Thickeners					X
Sauce and Spread Thickeners					X
Frozen Pizza Toppings				X	
Vegetable Burger Filler				X	X
Seasoning Blends				X	X
Seasoned Breadings				X	X



Sizes & Colors

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**. SCREEN SIZES ARE FOR REFERENCE ONLY. CONSULT YOUR CALIFORNIA WALNUT SUPPLIER FOR EXACT SPECIFICATIONS.

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 of which only 2% (included in the 15%) may be darker than light.

LIGHT AMBER:

No more than 15% shall be darker than light amber of which only 2% (included in the 15%) may be darker than amber.



LIGHT:

No more than 15% shall be darker than light of which only 2% (included in the 15%) may be darker than light amber.



AMBER:

No more than 10% shall be darker than amber.

IN-SHELL SIZES

Following drying, sizing of the in-shell nut occurs. In-shell walnuts are sized as jumbo, large, medium or baby according to USDA standards.

SIZE	SHELL DIAMETER	
Baby	1.0" – 1.15"	25.4 – 29.21 mm
Medium	1.15" – 1.20"	29.21 – 30.48 mm
Large	1.20" – 1.25"	30.48 – 31.75 mm
Jumbo	1.25" or greater	31.75 or greater

Refer to the USDA Standards at www.ams.usda.gov

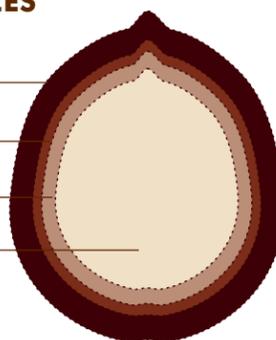
AVERAGE USDA SIZES

JUMBO

LARGE

MEDIUM

BABY



Source; USDA. United States Standards for Grades of Shelled Walnuts (*Juglans regia*). Agricultural Marketing Service. Effective September 1, 1968, reprinted January 1997. <http://www.ams.usda.gov/standards/walnuts.pdf> (Adobe Acrobat format).

USDA STANDARD SIZES FOR SHELLED WALNUTS

(See visual examples and USDA Table 3 on the following page)

WALNUT HALVES

Example # 1

Description: 7/8 or more of the kernel is intact. 85% or more of lot, by weight, are half kernels with the remainder three-fourths half kernels.

USDA Size Tolerances: No more than 5% smaller than three-fourths halves of which no more than 1% may pass through 16/64" (6.35 mm) round screen hole.

WALNUT PIECES AND HALVES

(Halves and Pieces) Examples #'s 2 & 3

Description: 20% or more of lot, by weight, are half kernels (7/8 or more of the kernel is intact).

USDA Size Tolerances: No more than 18% shall pass through 24/64" (9.53 mm) round hole of which no more than 3% may pass through 16/64" (6.35 mm) and of 3% no more than 1% may pass through 8/64" (3.18 mm) round screen hole.

WALNUT PIECES

Examples #'s 4, 5, 6, & 7

Description: Portions of kernels in lot cannot pass through 24/64" (9.53 mm) round openings.

USDA Size Tolerances: No more than 25% shall pass through 24/64" (9.53 mm) round hole of which no more than 5% may pass through 16/64" (6.35 mm) and of 5% no more than 1% may pass through 8/64" (3.18 mm) round hole included in the 5%.

WALNUT SMALL PIECES

Example #'s 11 & 12

Description: Portions of kernels in lot pass through 24/64" (9.53 mm) round openings but cannot pass through 8/64" (3.18 mm) round openings.

USDA Size Tolerances: 10% will not pass through 24/64" (9.53 mm) round hole and 2% pass through 8/64" (3.18 mm) round hole.

TYPICAL INDUSTRY SIZES

WALNUT MEDIUM PIECES

Example #'s 8 & 9

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 32/64" (12.7 mm) screen. No more than 3% may pass through 16/64" (6.35 mm) screen. No more than 1% may pass through 8/64" (3.18 mm) screen.

TOPPING PIECES

Example #'s 13 & 14

Description: Portions of kernels in lot pass through 1/4" (6.35 mm) square screen hole or a 20/64" (7.94 mm) round screen hole.

WALNUT MEAL (Double Diced)

Example # 15

The smallest form of the California walnut comes in various consistencies ranging from a coarse meal to a fine powder. Use walnut meal to dust cakes, integrate into dough and batter, and for walnut compounds. Finely ground walnuts are incorporated into pastas, added to fillings and used as a thickening agent in sauces.

SYRUPERS

Example # 10

Description: Portions of kernel in lot pass through 3/8" (9.53 mm) square screen hole or 28/64" (11.11 mm) round screen hole.

Sizes & Colors

USDA TABLE 3

TOLERANCE FOR SIZE

SIZE CLASSIFICATION	SMALLER THAN 3/4 HALVES	WILL NOT PASS THROUGH 24/64" ROUND HOLE	PASS THROUGH 24/64" ROUND HOLE	PASS THROUGH 16/64" ROUND HOLE	PASS THROUGH 8/64" 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 6/64 is tighter than the USDA standard of 8/64.



7 WALNUT PIECES, LIGHT/LIGHT AMBER



8 MEDIUM PIECES, LIGHT



9 MEDIUM PIECES, LIGHT



1 WALNUT HALVES, LIGHT



2 WALNUT PIECES AND HALVES, LIGHT



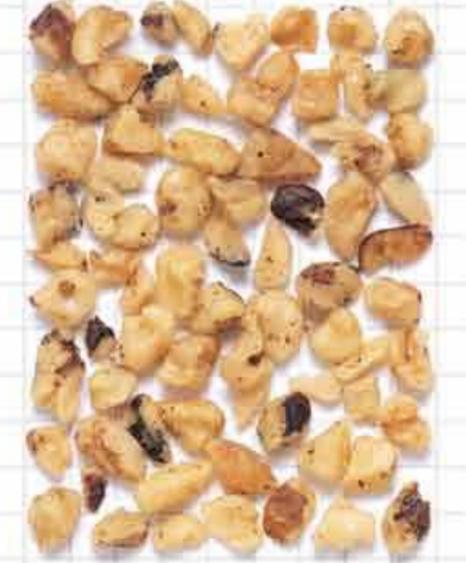
3 WALNUT PIECES AND HALVES, LIGHT/LIGHT AMBER



10 SYRUPEUR (DICED), LIGHT/LIGHT AMBER



11 SMALL PIECES, LIGHT



12 SMALL PIECES, LIGHT



4 WALNUT PIECES, LIGHT



5 WALNUT PIECES, LIGHT/LIGHT AMBER



6 WALNUT PIECES, LIGHT



13 TOPPING PIECES, LIGHT



14 TOPPING PIECES, LIGHT/LIGHT AMBER



15 WALNUT MEAL, LIGHT/LIGHT AMBER

STORAGE & USAGE TIPS

WALNUT MEAL

Walnut meal can be used to replace flour in baked goods. It reduces the gluten and carbohydrate content but it also increases fat. When walnut meal is used as a flour replacer in baked good applications, the amount of oil that is typically added to the product should be adjusted to achieve optimal finished product and texture. Remember that walnuts are best when freshly ground. When grinding, be careful as they turn into butter very quickly—use a little flour or sugar in the recipe while grinding.

WALNUT MEAL AND GLUTEN FORMATION

The fat in walnut meal shortens or “interrupts” the gluten strands preventing them from getting longer and will yield tender products. A combination of gluten free flour and walnut meal may result in a product without enough structure, thus R&D work is always necessary to achieve final desired texture.

WALNUT PIECES IN WET BATTERS

Walnut pieces will sink to the bottom of a wet batter and cause uneven nut distribution in the finished product. Pre-coating the walnut with gum or starch will keep the nut suspended. Alternatively, lightly toasting the walnuts will dehydrate them and make them lighter, which will improve the final suspension.

BLANCHED WALNUTS

Walnuts cannot be easily blanched because their general shape and contour makes it difficult to remove the skin. The best way to blanch walnuts is to either first warm them in the oven or boil them in water and then rub the skins off. Blanched walnuts can be used to help developers create refined baked good products that will not have any discoloration from the walnut skins. Sometimes lighter colored walnuts are available and those can be used as an alternative to blanching.

PREVENTING OXIDATION

Products that contain walnuts, especially roasted walnuts, are subject to oxidation which can reduce shelf life and cause rancidity. To prevent rancidity and extend finished product shelf life, the product should be packaged in materials that do not allow light or air to come into contact with the product. Packages that can be resealed are ideal for snack mixes which may be opened and closed several times by the consumer. Nitrogen flushing (replacing the oxygen with nitrogen) can also extend the shelf life of unopened sealed product. Walnuts that are formulated with coatings like chocolate, starches, gums, egg whites and sugar will have a longer shelf life than plain or roasted walnuts because they are protected by the coated exterior.

STORAGE TIPS

Follow these tips to maintain the high quality, freshness, flavor and nutritional value of California walnuts:

- Store in air-tight packaging.
- Store away from foods with strong odors, like cabbage and onions.
- Rotate inventory. Practice FIFO – First In, First Out.
- For storage up to six months: refrigerate at 0°C (32°F) to 5°C (41°F) at 65% relative humidity.
- For storage longer than six months: freeze at 18°C (0°F).

CALIFORNIA WALNUTS FOR YOUR NEEDS

Available in pieces and halves in 25 lb (11.25 kg) corrugated boxes with poly-lined bags. Smaller kernel sizes are usually available in 30 lb (13.25 kg) boxes. Suppliers also ship in 1,000–2,000 lb (907–1814 kg) containers, #10 tins, and other industrial sizes.

WHERE TO PURCHASE

For information about where to source premium walnuts, visit www.walnuts.org to view our handler’s list.

CALIFORNIA WALNUT Formulations



Walnut Milk	16
Orange Glazed Walnuts	17
Moroccan Spiced Walnuts	18
Muhammara Dip	19
Cheddar Cheese and Walnut Crackers	20
Spanish Style Walnut Romesco Sauce	21
Turkish-Style “Kibbeh” Meatballs	22
Walnut-Cardamom Cake	23
Walnut Chocolate Fleur de Sel	24

TOAST BEFORE YOU TOSS

Bring out the nutty, rich flavor of walnuts by toasting them before tossing into salads, stir-fries, pasta dishes and more. You can season walnuts with salt, sugar or spices to create an array of different flavors.

STANDARD OVEN: Spread chopped walnuts evenly onto a baking sheet or in a shallow pan. Bake at 350°F or 180°C for 5 to 7 minutes or until lightly browned. Stir several times for even toasting. Be sure to keep an eye on them though – they burn easily. Cool before using. Note: walnuts can be toasted dry or with a dash of oil.



WALNUT MILK



INGREDIENT	PERCENT (%)
Water	60.00%
Walnut Meal (Size #15)	32.00%
Flavoring	5.00%
Stabilizers (gum, starch or fiber)	3.00%
Totals (Calculated)	100.00%

Applications: Aseptic, retorted or pasteurized nut based dairy free beverages

Blend together walnut meal, flavoring and water into a mixing tank.

Run the mix through a series of shear mixers for further nut breakdown until desired consistency and fluidity is achieved.

Homogenize the mixture further to reduce particulates.

Use preferred heating process (pasteurization, aseptic or retort) to produce a refrigerated or shelf stable finished product.

Stabilizing system and flavors will vary depending on the chosen thermal process and desired sensory attributes.

Formulation created by Rachel Zemser for the California Walnut Board

ORANGE GLAZED WALNUTS

INGREDIENT	PERCENT (%)
Walnut Halves (Size #1)	76.60%
Sugar	11.36%
Water	9.70%
Orange Zest	1.77%
Salt	0.40%
*Natural Orange Flavor	0.17%
Totals (Calculated)	100.00%

*Bell Natural Orange Flavor ref # 101.3442

Applications: Confections and snacks

Mix together the water and sugar to make a simple syrup with desired consistency and brix level.

Add the orange flavor to the simple syrup.

Load up the kettle with walnuts and slowly add about 25% of the simple syrup to the mixture.

Slowly add more simple syrup while continually stirring until nuts are fully coated.

Cook until the sugar is crystallized. When the sugar begins to melt back into a syrup, turn off the fire and add the salt and orange zest.

Remove the batch from the cooker and pour onto a cooling belt.

Final product can be packaged in single serving bags or bulk.

Formulation created by Rachel Zemser for the California Walnut Board



MOROCCAN SPICED WALNUTS

INGREDIENT	PERCENT (%)
Walnuts-Halves and Pieces (Size #2, 3)	89.29%
Moroccan Blend #10-52 (First Spice Mixing Company)	7.14%
Soybean Oil	3.57%
Totals (Calculated)	100.00%

Applications: Snack blends and bakery inclusions

Toss the walnut halves and pieces in soybean oil using a tumbler, panner or by hand.

Add the seasoning blend and continue to blend until the nuts are evenly coated.

Spread the nuts out evenly on parchment paper and bake in a convection oven.

Time and temperatures will vary based on equipment being used.

Other Suggested Seasoning Blends:
 Persian Blend #10-50 (First Spice Mixing Company)
 Ras El Hanout Blend #5010652 (Griffith Laboratories)

Formulation created by Rachel Zemser for the California Walnut Board



MUHAMMARA DIP



INGREDIENT	PERCENT (%)
Fire Roasted Minced Red Pepper (IQF)	52.96%
Walnut Meal (Size #15)	19.57%
Plain Bread Crumbs (American)	7.37%
Olive Oil	6.10%
Tomato Paste (28 Brix)	5.76%
Pomegranate Molasses	3.80%
Lemon Juice Concentrate (55 brix)	1.84%
Chile Pepper Flakes 10,000–30,000 SHU	0.81%
Salt	0.81%
Sugar, Granulated	0.46%
Cumin	0.29%
Allspice	0.23%
Totals (Calculated)	100.00%

Applications: Low pH, hot or cold process, pasteurized, hot fill or retorted

Blend together all the ingredients.

The thickness of this product may vary and if needed, water can be added to adjust the viscosity to allow for improved flow through the processing equipment.

For commercial sterility, the pH of this product should be adjusted with lemon juice concentrate to below 4.3.

Processing temperatures will vary based on pH and processing equipment.

Please follow FDA regulations for all shelf stable acid and acidified foods.

Formulation created by Rachel Zemser for the California Walnut Board

CHEDDAR CHEESE AND WALNUT CRACKERS



INGREDIENT	PERCENT (%)
*Unbleached and Unbromated Wheat Flour	25.27%
Shredded Sharp Cheddar Cheese	20.16%
Chilled Butter Cubes	16.80%
Chopped Walnuts (Size #7, 8, 9)	16.80%
Cream Cheese	13.44%
Egg Yolks	6.72%
Ground Pepper	0.81%
Totals (Calculated)	100.00%

*General Mills Harvest King Flour

Application: Bakery

Cut chunks of butter into the flour until it resembles small, mealy-like pieces.

Add the remaining ingredients and mix until a dough forms.

Put the dough in a sheet pan with a 1-inch height thickness.

Let the dough rest in the freezer for at least 1 hour.

Cut the dough into 5-inch long strips.

Cut the individual strips into 1/12 inch thick slices.

Put the slices on a sheet pan with parchment paper and use an egg wash on the top.

Bake at 400°F in a convection oven until the edges are golden brown.

Retail product can be packaged as a raw and frozen item that the consumer can cut and bake from home.

Formulation created by Jean Yves Charon for the California Walnut Board

SPANISH STYLE WALNUT ROMESCO SAUCE

INGREDIENT	PERCENT (%)
¼ inch Dice Tomato in Juice	45.769%
Fire Roasted Minced Red Pepper (IQF)	24.715%
Sautéed Minced Onion (IQF)	10.984%
Walnut Meal (Size #15)	7.323%
Sherry Vinegar (70 grain)	2.873%
Orange Juice Concentrate (60 Brix)	2.701%
Olive Oil	2.472%
Oven Roasted Diced Garlic (IQF)	1.831%
Salt	1.149%
Red Pepper Flakes (10,000-30,000 SHU)	0.183%
Totals (Calculated)	100.00%

Applications: Low pH, hot or cold process, pasteurized, hot fill or retorted

Blend together all the ingredients.

The thickness of this product may vary and if needed, water can be added to adjust the viscosity to allow for improved flow through the processing equipment.

For commercial sterility, the pH of this product should be adjusted with vinegar or citric acid to below 4.3.

Processing temperatures will vary based on pH and processing equipment.

Please follow FDA regulations for all shelf stable acid and acidified foods.

Formulation created by Rachel Zemser for the California Walnut Board



TURKISH STYLE “KIBBEH” MEATBALLS

INGREDIENT PERCENT (%)

INGREDIENT	PERCENT (%)
MEATBALLS	
Ground Lamb	63.09%
IQF Minced Onion	19.59%
Walnut Medium Pieces (Size #8, 9, 10, 11, 12)	15.46%
Salt	1.06%
Marash Pepper	0.80%
Total	100.00%

BULGUR WHEAT DOUGH

Bulgur Wheat	70.00%
Boiling Water	25.00%
Corn Starch	2.00%
Farina Flour	2.00%
Black Pepper	1.00%
Totals (Calculated)	100.00%

Application: Savory and encrusted prepared foods, food service, refrigerated retail products

Mix together the ground lamb, walnuts, minced onion and seasonings.

Cook the meat mixture and drain off about half the fat.

Add boiling water to the bulgur wheat and let it soak for 30 minutes.

Add the starch, flour, and black pepper to the water-soaked bulgur wheat.

Refrigerate the dough and meat separately for 2 to 4 hours before production.

Feed both ingredients separately into the hoppers of a *KN550 Rheon Encrusting machine.

Kibbeh bulgur wheat dough-coated walnut meatballs will extrude out with the classic “football” shape.

Bake the encrusted meatball until the outside coating is a golden brown and fully cooked.

Flash freeze the fully cooked encrusted meatballs and fill into bags for a frozen retail product.

Finished ready-to-eat product can be reheated in the deep fryer, oven or microwave.

Formulation created by Rachel Zemser for the California Walnut Board

*Rheon Encrusting Equipment can be found at rheon.com



WALNUT-CARDAMOM CAKE



INGREDIENT PERCENT (%)

Granulated Sugar	32.50%
Whole Eggs	25.71%
Butter	16.67%
Cake Flour	15.77%
Walnut Pieces (Size #10, 11, 12)	7.71%
Baking Powder	0.73%
Cardamom	0.73%
Salt	0.18%
Totals (Calculated)	100.00%

Application: Bakery

Cream the butter and sugar on low speed in an industrial mixing bowl.

Add the eggs to the mixing bowl and continue to mix on low speed.

Sift in the dry ingredients (cake flour, baking powder, salt, cardamom) into the mixing bowl.

Add the walnuts and continue mixing until the batter becomes homogenous.

Deposit the batter into a paper tray or a parchment-lined springform pan and top with walnut pieces.

Bake at 350°F for 35 to 40 minutes until center of the cake reaches 210°F.

Retail product can be manufactured, baked and shipped frozen to retail markets.

Formulation created by Jean Yves Charon for the California Walnut Board

WALNUT CHOCOLATE FLEUR DE SEL



INGREDIENT

*Walnut Halves (Size #1)

INGREDIENT	PERCENT (%)
Sugar	38.36%
Cream	28.77%
Butter	14.38%
Evaporated Milk	9.59%
Glucose	8.44%
Fleur de Sel	0.38%
Tahitian Vanilla Bean	0.08%
Totals (Calculated)	100.00%

*Quantity of walnuts will vary based on caramel quantities made.

Application: Confections

Scald cream with vanilla bean and evaporated milk.

Dry cook 2/3 of the sugar, add glucose, then continue to dry cook remaining sugar.

Once desired color is achieved, stir in butter (it will not fully incorporate).

Strain the cream into pot slowly, stir and cook to 245°F.

Pour into frame or onto cooling table.

When nearly cool, press walnuts into caramel and cut to desired size.

When set and completely cool, dip or coat in tempered chocolate.



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Check out the food professionals section to download promotional materials, such as the sizes and colors chart, flavor wheel, buyers guide and more.

Our online recipe section will show you that walnuts are a versatile addition to any meal, from salads to mains to desserts.

Contact us to receive hard copies of our promotional materials, handlers and more.

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