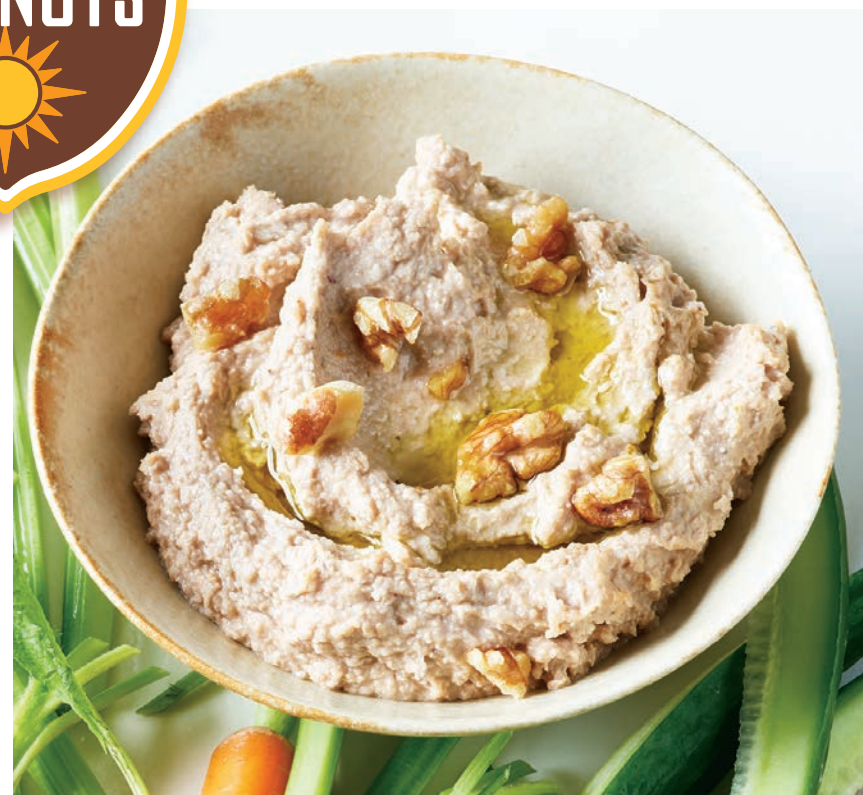


CALIFORNIA WALNUTS

# TECHNICAL GUIDE

FOR FOOD PROFESSIONALS



# WHY CALIFORNIA WALNUTS?

California walnuts offer a unique flavor and texture, making them wonderfully versatile for both savory and sweet food product applications. As a result, research chefs and tastemakers around the world increasingly find new and exciting ways to incorporate walnuts.

Try adding walnuts to baked goods, dessert bars and chocolate confections for a nutty crunch; to sauces and spreads as a wholesome thickener; or as a plant-based alternative to meat. Discover the diversity of walnuts as the perfect showcase ingredient in the biggest savory and sweet flavor trends.



## ▶ TASTE

Walnuts from California have a sweet mild taste that makes savory sweet, and sweet savory.

## ▶ VERSATILITY

The mild flavor and texture of a softer nut like walnuts makes them a versatile ingredient for flavor profiles in a wide range of packaged foods – baked goods, desserts, confections, spreads and sauces, and plant-based meat alternatives.

## ▶ COLOR

Walnuts from California are sold according to size and color, ranging from light to amber, with lighter walnuts being the most popular for aesthetic reasons. See the Size & Color section to find the right fit for your needs.

## ▶ VALUE

Walnuts are nutrient-rich and add value consumers will recognize and appreciate. As a topping, inclusion in a chocolate confection, a crust or a creamy center, California walnuts are an ideal ingredient for food professionals looking to deliver new creative products without sacrificing flavor, texture or nutrition.

## ▶ NUTRITION

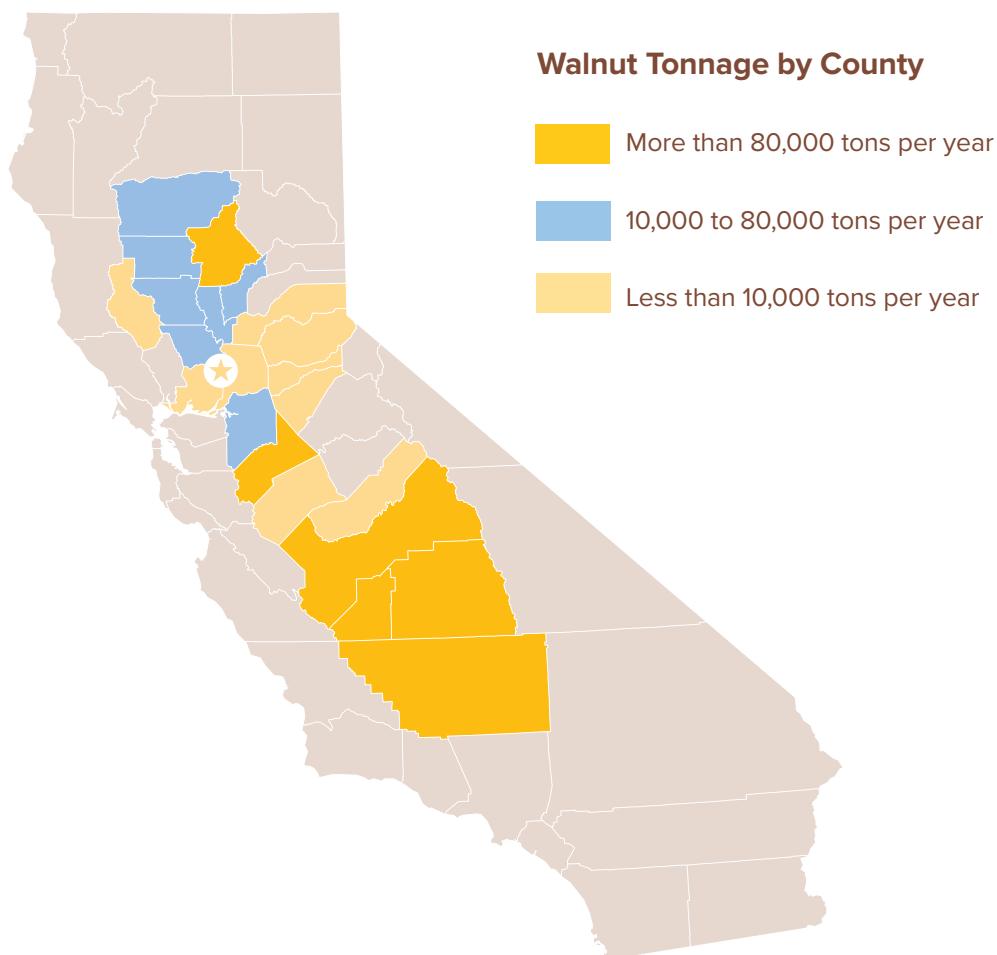
California walnuts are a whole food contributing many beneficial nutrients to the diet. For example, walnuts are the only nut to contain a significant amount of the plant-based omega-3, alpha-linolenic acid (2.5 grams per ounce of English walnuts or 9g per 100g). They're also a good source of magnesium (44mg per ounce or 160mg per 100g) and phosphorus (98mg per ounce or 350mg per 100g) – both important minerals involved in the body's processes.



# WHERE ARE WALNUTS GROWN?

- ▶ More than 99% of the walnuts in the U.S. are grown in the fertile soils of California's Central Valley. Internationally, California supplies two-thirds of the world's walnut trade.

## ORIGIN + GROWING



## THE CALIFORNIA WALNUT INDUSTRY

**The California Walnut Commission**, established in 1987, represents the interests of the 4800+ walnut growers and the nearly 100 handlers spread across California's Central Valley. The industry generates \$1.2 billion in farm gate revenue and supports some 85,000 jobs directly and indirectly. 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.



# HARVESTING, PROCESSING & GRADING

## HOW WALNUTS ARE GROWN

It's a long road from planting a walnut orchard to delivering fresh, delicious walnuts to food professionals. Each step in the process from propagation, to harvest, to packer, and finally to market, is handled with care and attention. There are 4,800+ walnut growers, a large majority being family farms, many of which have been in the walnut business for several generations. After a walnut sapling is planted, it takes four to five years for it to grow into an adult tree suitable for commercial harvesting. Although many varieties of walnuts are grown in California, four varieties account for over 90% of the market and are similar in their taste and functionality.



### HARVEST

The harvest begins in late August, when the outer green hulls start to split, allowing the in-shell walnuts to be removed, and continues through late November.

### GATHER

First, the orchard floor is swept clean. Then, mechanical shakers vigorously shake each tree and thousands of walnuts fall to the ground. The walnuts are then carefully swept into windrows to allow mechanical harvesters to pick them up for cleaning.

### PROCESS

The outer green husk is removed by a huller and the nut is washed, then mechanically dehydrated (air-dried) to the optimum 8% moisture level. This prevents deterioration of the nut and protects its quality during storage. Walnuts are stored in-shell until needed for cracking. California walnuts are protected from contamination due to the nut's double envelope of hull and shell while on the tree.



### GRADE

Walnuts are transported to a packing plant where they are graded based on usage, in-shell or shelled.

### SHELL

Shelled walnuts are further graded by color, as shown in the walnut color chart.

### SCREEN & SEPARATE

Walnut kernels are screened and separated into different sizes (refer to Size and Color chart).



# 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 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 and 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 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 directly exposed to the heat. Roasted walnuts can be used in 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), to minimize oxygen and light exposure. Shelf life studies help determine product quality and expiration dates of finished goods.

# SIZE & COLOR: EXAMPLES



1



2



3



4



5



6



7



8



9



10



11



12



13



14



15

- ▶ **HALVES:** example 1
- ▶ **PIECES & HALVES:** examples 2 and 3
- ▶ **PIECES:** examples 4, 5, 6 and 7
- ▶ **MEDIUM PIECES:** examples 8 and 9
- ▶ **SMALL PIECES:** examples 11, 12 and 14
- ▶ **MEAL/DOUBLE DICED:** example 15
- ▶ **TOPPING PIECES:** examples 13 and 14
- ▶ **SYRUPERS:** example 10

# SUGGESTED WALNUT FORM APPLICATIONS

APPLICATION	HALVES	PIECES	MEDIUM PIECES	SMALL PIECES	MEAL
<b>Confections</b>					
Chocolate bars	●	●	●	●	●
Truffles/fudge	●	●	●	●	
Nougat		●	●	●	
Chocolate walnut spreads/walnut butters		●	●	●	
Chocolate covered walnuts	●	●	●	●	
Caramelized walnut inclusions/pralines	●	●	●	●	
Seasoned walnut inclusions	●	●	●	●	
Dustings			●	●	●
Cake pop center	●	●	●	●	●
Walnut crème	●	●	●	●	
Seasoned walnut popcorn inclusion	●	●	●	●	
<b>Bakery</b>					
Pies/tarts/cakes	●	●	●	●	●
Pancakes/waffles	●	●	●	●	●
French toast		●	●	●	●
Breads/bagels		●	●	●	●
Cookies/muffins	●	●	●	●	●
Brownies/strudels	●	●	●	●	●
<b>Savory</b>					
Meat alternative products (burgers/meatballs)			●	●	●
Salad toppings	●		●	●	●
Seasoned or spiced walnuts	●		●	●	●
Frozen entrées or sauces	●		●	●	●
Meat pies		●	●	●	●
Salad dressings		●	●	●	●
Stuffing mixes	●	●	●	●	●
Spreads and dips	●	●	●	●	●
Hummus	●	●	●	●	●
Pesto	●	●	●	●	●
Ravioli filling	●	●	●	●	●
Coating for meat, poultry and seafood	●	●	●	●	●



# CALIFORNIA WALNUT COLORS

California walnut handlers supply both light walnut halves and pieces, or a blend of light to amber walnuts. Check with your handler or supplier for availability. But what about the other options? California walnuts are sold according to size and color, ranging from light to amber, with the lighter walnuts being the most popular for aesthetic reasons. But the difference is more than just color. With each color variation also comes a range of flavor components. Knowing the difference in these flavor variations can make a difference in your products. Perhaps you already have a chocolate confection that could benefit from a darker walnut? Or maybe you don't know where to begin incorporating these color variations of California walnuts into your product line. As a starting point, here are some suggested applications:

## LIGHT WALNUT APPLICATION IDEAS

- ▶ Toasted in baked goods and breads
- ▶ Puréed for light-colored dressings and sauces
- ▶ Chopped for crusts and coatings
- ▶ Sprinkled on tarts, confections and as salad toppers

### LIGHT WALNUTS

Earthy notes  
Mild flavor  
Subtle tannins  
Greater availability



## LIGHT AMBER WALNUT APPLICATION IDEAS

- ▶ Ground/chopped as a component of an authentic-looking meat replacement
- ▶ Toasted and puréed for hummus, sauces and spreads
- ▶ Complements rich chocolate desserts
- ▶ Finely chopped for coating/frying

### LIGHT AMBER WALNUTS

Robust flavor  
Round tannins  
Slightly sweet finish  
More economical choice



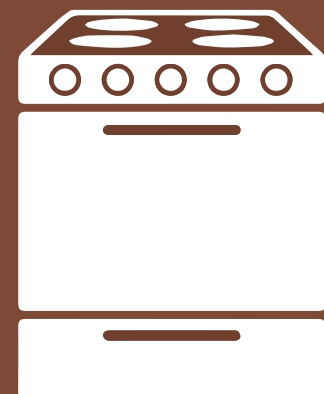
More information on light and light amber California walnuts can be found by visiting [walnuts.org](http://walnuts.org).



## 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.

Spread chopped walnuts evenly onto a baking sheet or in a shallow pan. Bake at 350°F or 180°C for 8 to 10 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.



# USAGE, STORAGE & PURCHASE TIPS

## WALNUT MEAL

Walnut meal makes a great gluten free flour replacement in baked goods. As it may increase total fat content, the amount of oil typically added to the product should be adjusted to achieve an optimally finished product and texture. Remember, walnuts are best when freshly ground. When grinding, be careful as they turn into butter very quickly. Add 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 the 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’ unique shape and contours make it more challenging 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 can be used as an alternative to blanching.

## PREVENTING OXIDATION

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. Resealable packaging is 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 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

Halves and pieces are available in 25 lb (11.25 kg) corrugated boxes lined with poly 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 the Food Professionals section on [walnuts.org](http://walnuts.org) to view our handler’s list.



# QUALITY ASSURANCE & FOOD SAFETY

The walnut industry has had an exceptional track record for food safety for over a century. Today's growers and handlers are continuing that legacy with proactive ways to minimize any potential food safety problems with voluntary GMP (Good Manufacturing Practices) inspections and GFSI (Global Food Safety Initiative) certifications. Food Safety is critically important to the California Walnut Industry. California walnuts are grown and processed under strict quality control standards in order to deliver a high quality product year round.



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. As a result, California walnuts often exceed quality standards set by the United States Department of Agriculture (USDA).

Walnut growers set the stage for producing a safe, wholesome crop by following the FDA's new "Produce Safety Rule" and Good Agricultural Practices (GAP's). During development, walnuts are uniquely protected by nature. Walnuts have both a protective hull and shell, which encase and help protect the kernel. Throughout the shelling process, rules established by the FDA called Good Manufacturing Practices (GMP's), are stringently followed. These practices ensure walnuts are produced under the cleanest manufacturing conditions.

**\$2.2 MILLION**

**Spent on Food Safety  
Training and Research  
since 2009**

The California Walnut industry continually invests in food safety training and food safety research projects. Since 2009, the California Walnut Board has spent more than \$2.2 million on food safety training and research activities.

## SUSTAINABILITY

**The California walnut industry has spent more than a century caring for the land, the people with whom we work and our local communities. This approach has helped our industry grow and thrive, and to be sustainable for generations to come.**

## ALLERGEN LABELING

**Maintaining a safe environment for those with allergies is always top-of-mind for the walnut industry.**

The Food Allergen Labeling and Consumer Protection Act (FALCPA) requires food professionals to identify the presence of the eight major food allergens on food labels. As an amendment to the Food, Drug & Cosmetic Act, the FALCPA targets packaged foods regulated by the FDA. The FALCPA labeling law does not directly apply to foodservice operations.

According to Food Allergy Research & Education (FARE), a very small portion of the American population is allergic to peanuts (0.6% to 1.3%) or tree nuts (0.4% to 0.6%). Reading ingredient labels for all products and asking questions of your suppliers is the key. The FARE organization is a great resource for information on food allergies.

# CONSUMER RESEARCH

## FOOD TRENDS & WALNUT USAGE

California Walnuts commissioned consumer research, which includes insights related to walnut usage in packaged foods. The study, conducted by an independent research firm in 2017, fielded an online survey to 3,032 people, providing a sample consistent with gender and regional distribution of walnut users and non-users in the United States.

### FOOD TRENDS SHIFT: PURE HEALTH TO BALANCING AND EXPERIMENTING



**94%** of consumers\* are looking for creative ways to explore a more balanced diet

In 2017, of those surveyed, consumers are eating more whole foods, more nuts, fewer carbs and more good fats (up from 2013). Eating more fruits and vegetables remains the top eating habit people report doing to improve their health (71%), followed by eating more nuts (51%).

**Walnuts are an ideal ingredient for food professionals looking to deliver new creative products without sacrificing flavor, texture or nutrition.**

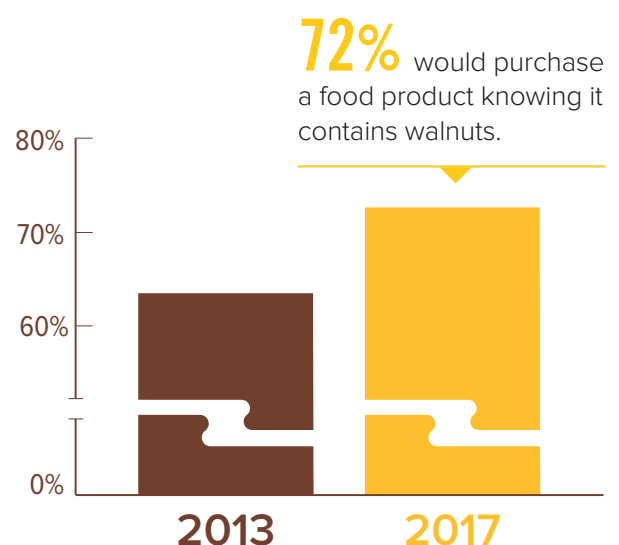
Consumers believe walnuts can be used across a wide variety of usage occasions. Cookies, baking mixes, cakes and pastries are among the biggest opportunity for walnut acceptance.



**Taste was cited as the #1 reason among consumers for consuming walnuts**

Of those surveyed, the #1 reason people consume walnuts is because they are delicious (78%, up 4% from 2013). People are finding them more convenient, versatile and a better value than ever before.

Interestingly, walnut consumers tend to be more outgoing and adventurous when it comes to trying new foods and eating healthy. 80% of walnut users surveyed like trying new recipes (which could be applied to purchase attitudes toward prepared food products). 65% pay close attention “to the healthfulness of ingredients” in food.



\*Consumers Surveyed

# STRONG CONSUMER INTEREST IN WALNUT PRODUCTS ACROSS CATEGORIES

## A FAVORABLE RESPONSE TO WALNUTS IN PRODUCTS

As walnut demand is on the rise due to taste and preference, interest in walnut products is particularly strong in these categories.

Survey question: How likely would you be to purchase the following manufactured or pre-made products that contain walnuts?



## WALNUTS HAVE STRONG HEALTH PERCEPTIONS

Walnuts are strongly recognized as “nutritious” and “all natural.” Value perceptions of walnuts have increased significantly, alongside convenience.

Survey question: How much do you agree with the following statements used to describe walnuts?

	2013	2017
Nutritious	80%	91%
Natural	(not surveyed)	89%
Convenient	72%	81%
Versatile	66%	78%
Good Value	49%	59%

- ▶ In 2017, 82% said walnut health benefits positively impacted their decision to purchase them

## ON-PACKAGE LABELING OPPORTUNITIES

Heart-specific and walnut messaging may be a way to engage the health-minded consumer for walnut products. In 2017, 72% of participants were likely to purchase food products labeled “heart healthy”; 65% if labeled “contains healthy walnuts”; and 63% if labeled “contains walnuts”.

Consumers know omega-3s are “good” (87% of walnut consumers and 78% of non-consumers positively perceive omega-3s). Walnuts are the only nut with an excellent source of alpha-linolenic acid, or ALA, the plant-based omega-3 fatty acid.

71% of consumers are more likely to purchase walnuts with the California Walnuts logo on the package.

The California Walnut logo is available free for use on packaging. Email [info@walnuts.org](mailto:info@walnuts.org) to find out more.

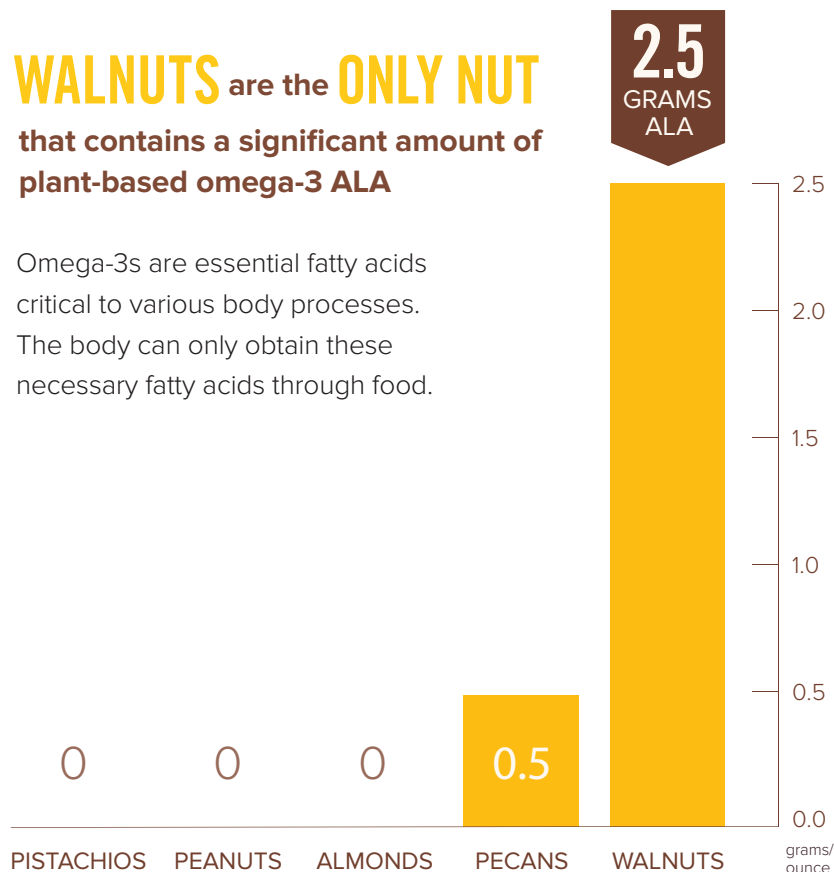


# WALNUT NUTRITION & SCIENTIFIC RESEARCH

California walnuts are a whole food contributing many beneficial nutrients to the diet. For example, walnuts are the only nut to contain a significant amount of the plant-based omega-3, alpha-linolenic acid (2.5 grams/ounce of English walnuts or 9g in 100g quantity). Walnuts also offer protein, fiber and a good source of magnesium.

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

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.

Walnuts' unique nutrient profile also makes it easy to meet the 2015-2020 Dietary Guidelines for Americans. The Dietary Guidelines encourage a healthy eating pattern emphasizing nutrient-dense, plant-based foods and includes a variety of protein sources, including nuts and seeds, seafood, lean meats and poultry, eggs, legumes and soy products.

The Dietary Guidelines also emphasize the importance of reducing saturated fat intake to less than 10% of calories per day and shifting food choices from those containing saturated fats to those with polyunsaturated fats. Walnuts are predominantly composed of polyunsaturated fat (13 out of 18 grams of total fat per 1 ounce serving), making them an ideal food to help Americans meet this recommendation.

To date, clinical research has been conducted in the areas of heart health, diabetes, cognitive function, aging, cancer and bone health. More information on these studies can be found at [walnuts.org](http://walnuts.org).



## NUTRIENTS IN 100G OF ENGLISH WALNUTS

NUTRIENT	AMOUNT RAW DATA	AMOUNT ROUNDED DATA	AMOUNT UNIT
Calories	654	650	
Total fat	65.21	65	g
Saturated fat	6.126	6	g
Trans fat	0	0	g
Polyunsaturated fat	47.174	47	g
<i>Linoleic acid (18:2)</i>	38.093	38	
<i>Linolenic acid (18:3)</i>	9.08	9	
Monounsaturated fat	8.933	9	g
Cholesterol	0	0	mg
Sodium	2	0	mg
Total Carbohydrates	13.71	14	g
Dietary Fiber	6.7	7	g
Total Sugars	2.61	3	g
Added Sugars	0	0	g
Protein	15.23	15	g
Vitamin D	0	0	mcg
Calcium	98	100	mg
Iron	2.91	2.9	mg
Potassium	441	440	mg
Vitamin A	1	0	mcg RAE
Vitamin C	1.3	1	mg
Vitamin E	0.7	0.7	mg
Vitamin K	2.7	3	mcg
Thiamin	0.341	0.3	mg
Riboflavin	0.15	0.2	mg
Niacin	1.125	1.1	mg
Vitamin B6	0.537	0.5	mg
Folate	98	100	mg DFE
Vitamin B12	0	0	mg
Pantothenic acid	0.57	0.6	mg
Phosphorus	346	350	mg
Magnesium	158	160	mg
Zinc	3.09	3.1	mg
Selenium	4.9	5	mcg
Copper	1.586	1.6	mg
Manganese	3.414	3.4	mg
Choline	39.2	40	mg
Betaine	0.3	0.3	mg
Tocopherol, Alpha	0.7	0.7	mg
Tocopherol, Beta	0.15	0.15	mg
Tocopherol, Gamma	20.83	20.83	mg
Tocopherol, Delta	1.89	1.89	mcg
Carotene, Beta	12	12	mcg
Carotene, Alpha	0	0	mcg
Cryptoxanthin, Beta	0	0	mcg
Lutein + Zeaxanthin	9	9	mcg

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

g = Gram  
mg = Milligram  
mcg = Microgram

RAE = Retinol Activity Equivalent  
DFE = Dietary Folate Equivalent



# WALNUTS & HEART HEALTH

Since 1993, published research has reported how eating walnuts affects various heart health biomarkers and risk markers including:

- ▶ LDL and HDL cholesterol
- ▶ Apolipoprotein B and non-HDL cholesterol
- ▶ Blood pressure
- ▶ Inflammation
- ▶ Endothelial function
- ▶ Plaque formation

Due to the evidence supporting the cardiovascular benefits of walnuts, 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.”<sup>1</sup>



Per one ounce serving.

**California walnuts are certified by the American Heart Association® with the Heart-Check mark.\***

Please note the Heart-Check Food Certification does not apply to scientific research by an organization other than the AHA unless expressly stated. For more information, see the AHA nutrition guidelines at: [heartcheckmark.org/guidelines](http://heartcheckmark.org/guidelines).

\* Heart-Check food certification does not apply to recipes unless expressly stated. See [heartcheckmark.org/guidelines](http://heartcheckmark.org/guidelines). <sup>1</sup>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. (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.



# WALNUTS & HEALTHY AGING

The synergistic effects of walnuts, or their bioactive components, as contributing factors in protecting against the detrimental effects of aging is an important topic as the population ages. Nutrients found in walnuts, such as polyphenols, tocopherols and polyunsaturated fatty acids have been studied to evaluate the impact on reducing oxidative stress and inflammation.

## WALNUTS & DIABETES AND METABOLIC SYNDROME

Individuals with diabetes or metabolic syndrome often have conditions such as high blood pressure, abnormal cholesterol levels, high triglycerides and obesity. Together, these disorders increase the risk for heart disease and stroke. Scientists have looked at the association between walnut consumption and these conditions. Contributing evidence shows the importance of walnuts as part of a healthy diet that may help manage factors associated with diabetes and metabolic syndrome.

## WALNUTS & THE MEDITERRANEAN DIET

There are various forms of the Mediterranean diet which emphasizes more fruits and vegetables, nuts and seeds (including walnuts), grains, olive oil, moderate amounts of fish, poultry, eggs and wine, and limits the amounts of red meat, processed meat, dairy and sweets. The 2015-2020 Dietary Guidelines for Americans recommend a Mediterranean-style eating pattern as one example of a healthy diet plan.

## WALNUTS & GUT HEALTH

Emerging research on the gut microbiome and its impact on health continues to shed light on how certain foods, like walnuts, may impact gut health. Scientists are finding certain foods contribute to positive changes in the gut. Although there is still much to learn, studies suggest walnuts may play a role in improving gut health, including increasing the amount of beneficial bacteria in the gut.



# TASTING RESEARCH

## PAIRING WALNUTS

In a 2017 study conducted by the Davis Sensory Institute, consumers evaluated walnuts prepared in 15 sweet, spicy, and savory applications. Food formulators can experiment with the top pairing combinations among consumers.



### TOP 7 PAIRINGS

- ✓ **DARK CHOCOLATE**  
+ Walnuts
- ✓ **VANILLA**  
+ Walnuts
- ✓ **SESAME CAYENNE**  
+ Walnuts
- ✓ **SEA SALT CARAMEL**  
+ Walnuts
- ✓ **COFFEE**  
+ Walnuts
- ✓ **CANDIED ORANGE**  
+ Walnuts
- ✓ **CINNAMON CHAI  
SPICE**  
+ Walnuts



# PRODUCT FORMULATIONS

## WALNUT-CARDAMOM CAKE

INGREDIENTS	RECIPE %
Granulated sugar	32.50%
Whole eggs	25.71%
Butter	16.67%
Cake flour	15.77%
California walnut pieces (sizes #10, 11, 12)	7.71%
Baking powder	0.73%
Cardamom	0.73%
Salt	0.18%
<b>YIELD</b>	<b>100.00%</b>

### PREPARATION

1. Cream the butter and sugar on low speed in an industrial mixing bowl.
2. Add the eggs to the mixing bowl and continue to mix on low speed.
3. Sift in the dry ingredients (cake flour, baking powder, salt, cardamom) into the mixing bowl.
4. Add the walnuts and continue mixing until the batter becomes homogenous.
5. Deposit the batter into a paper tray or a parchment-lined springform pan and top with walnut pieces.
6. Bake at 350°F for 35 to 40 minutes until the cake center reaches 210°F.
7. Retail product can be manufactured, baked and shipped frozen to retail markets.



## BURNED CARAMEL WALNUT TART FILLING

INGREDIENTS	RECIPE %
California walnut halves	29.74%
Sugar	19.74%
Heavy cream	15.59%
Water	15.00%
Butter	13.03%
Honey	6.90%
<b>YIELD</b>	<b>100.00%</b>

### PREPARATION

1. Cook the sugar and water at 293°F until it reaches the hard crack stage.
2. Add the honey, butter and heavy cream one by one to the caramel mixture.
3. Put the entire blend back on the stove until it reaches 257° to 266°F and thickens slightly.
4. Pour final mixture onto walnut halves and stir until well coated.
5. Store refrigerated in closed container.
6. Gently reheat in a microwave or stove top to bring it back to a flowable state.
7. Fill tart shells with warm viscous product. Manufacturer can use their own tart shell for this application.
8. Walnut mixture can be manufactured and shipped to food service operations as a tart filling.



## WALNUT PESTO



### INGREDIENTS

	RECIPE %
Olive oil, extra virgin	26.33%
California walnuts	19.75%
Parmesan, grated	14.22%
Basil, fresh	13.17%
Lemon juice	9.71%
Water	8.43%
Parsley, fresh	3.69%
Kosher salt	2.63%
Garlic cloves	1.25%
Lemon zest	0.69%
Black pepper	0.13%

### YIELD

**100.00%**

### PREPARATION

1. Combine basil, parsley, walnuts, parmesan, lemon zest and lemon juice, garlic, salt and pepper in food processor and pulse until puréed.
2. Drizzle in olive oil and finish with water.

## WALNUT MILK



### INGREDIENTS

	RECIPE %
Water	60.00%
California walnut meal (Size #15)	32.00%
Flavoring	5.00%
Stabilizers (gum, starch or fiber)	3.00%

### YIELD

**100.00%**

### PREPARATION

1. Blend together walnut meal, flavoring and water into a mixing tank.
2. Run the mix through a series of shear mixers for further nut breakdown until desired consistency and fluidity is achieved.
3. Homogenize the mixture further to reduce particulates.
4. Use preferred heating process (pasteurization, aseptic or retort) to produce a refrigerated or shelf stable finished product.
5. Stabilizing system and flavors will vary depending on the chosen thermal process and desired sensory attributes.

## TOASTED WALNUT HUMMUS

INGREDIENTS	RECIPE %
Canned chickpeas	51.35%
California walnuts, toasted	27.73%
Walnut oil	8.42%
Orange juice	6.29%
Water	3.89%
Kosher salt	1.13%
Garlic cloves	0.55%
Orange zest	0.52%
Black pepper	0.12%
<b>YIELD</b>	<b>100.00%</b>

### PREPARATION

1. Toast walnuts in 350°F degree oven for 8 minutes. Cool.
2. Purée walnuts, oil and garlic.
3. Add chickpeas, orange zest, orange juice, salt, pepper and water and blend until smooth.



## WALNUT BUTTER

INGREDIENTS	RECIPE %
California walnuts	90.00%
Sugar	6.00%
Palm oil	3.50%
Salt	0.50%
<b>YIELD</b>	<b>100.00%</b>

### PREPARATION

1. Feed walnuts, salt, sugar and palm oil into a mill.
2. Keep milling temperature between 165° – 195°F to prevent burning and rancidity.
3. Pass nut butter through an aerator to remove trapped air.
4. Run final smooth product through heat exchanger to cool finished walnut butter product.
5. Fill into jars and bottles.



## WALNUT MUSHROOM SOUP



### INGREDIENTS

	RECIPE %
Vegetable broth	50.31%
Mushrooms, mixed and sliced	37.74%
Shallots, minced	3.17%
Olive oil, extra virgin	1.05%
Garlic, minced	0.42%
Kosher salt	0.42%
Thyme, dried	0.06%
Pepper	0.02%
California Walnut Cream	6.81%

### YIELD

**100.00%**

### California Walnut Cream

	RECIPE %
Water	53.85%
California walnuts	46.15%

### YIELD

**100.00%**

### PREPARATION

1. In a Vitamix combine water and California walnuts on high until puréed and smooth.
2. Heat oil in large pot and sauté shallots and garlic. Add mushrooms, thyme, salt and pepper and cook on low until softened.
3. Add broth and blend until softened.
4. Stir in California Walnut Cream.

## WALNUT MEAT CRUMBLE



### INGREDIENTS

	RECIPE %
California walnuts	34.27%
Canned chickpeas	31.11%
Vegetable oil	26.91%
Sweet paprika	3.04%
White wine vinegar	2.55%
Kosher salt	0.95%
Dried onion, minced	0.53%
Garlic powder	0.49%
Black pepper	0.15%

### YIELD





**100.00%**

### PREPARATION

1. Combine all ingredients in a food processor and pulse until walnuts are the size of a grain of rice. Do not purée.



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