

**Pizza Makers Information Guide to**

# REAL CALIFORNIA CHEESE

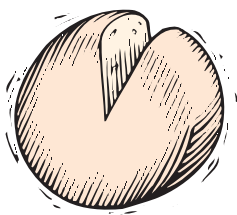




The California Milk Advisory Board (CMAB) developed this guide to introduce you to the unlimited possibilities of Real California Cheese. As pizza makers, you told us the important product quality factors for your cheese selection. This guide addresses those factors by describing how moisture levels of various California cheeses affect the flavor, texture, and appearance of your pizzas. Information about cheese handling, storage, meltability and flavor also is provided to help you determine which Real California Cheeses are best for your pizza creations.

## Fresh from the Start

*The nation's leading dairy state, California produces more milk than any other state and is the second largest cheese producing region, with approximately 50% of its milk going into cheesemaking. Real California Cheese is made from fresh, California milk and produced locally by California cheesemakers.*



## What's the Deal with the Seal?

Real California Cheese is distinguished by the black and gold Real California Cheese seal. This seal certifies that the cheese carrying it is natural, and made in California exclusively from California milk.

Pizza makers and pizza lovers recognize that top quality ingredients make a pizza great. Along with freshly made dough and the finest meats and vegetables, cheese makes an important contribution to the flavor and appearance of your pizzas.

### Consumers Look for the Seal

It should come as no surprise, cheese is more popular than ever. Over the last 21 years, the CMAB has spent millions of advertising and promotion dollars to create a distinctive affection among consumers for cheese carrying the Real California Cheese (RCC) seal. Thanks to the CMAB's "Happy Cows" campaign, consumers are looking for the RCC seal. 69% of women surveyed recall the campaign and the RCC seal. More than 80% of pizza makers also recognize the RCC seal and feels its natural message is meaningful.

By choosing Real California Cheese, you not only benefit from the quality cheeses produced in California, you also put the power of the "Happy Cows" advertising and promotion campaign behind every pizza you make.

## We asked, You said...

*What makes pizza makers decide which cheese to choose?*

*What are the important product quality factors for cheese selection?*

A recent survey of California pizza makers identified the following criteria for cheese selection:

- ▶ After cooking appearance (looks appetizing when cooked)
- ▶ Texture (does not get soggy when cooked)
- ▶ Melts evenly when cooked
- ▶ Is high quality cheese
- ▶ Does not burn when cooked
- ▶ 100% natural.



# Real California Cheese



## What is Cheese?

Cheese has long been valued not just for its great taste, but also as a way of storing and easily transporting the natural goodness of milk. The basic principles of cheesemaking are the same for all natural cheeses. The object is to extract the water from milk, leaving the milk solids (protein, vitamins, fat, etc.) behind. Several factors determine the type and flavor of the cheese produced. These include the type of culture used, the amount of whey (the liquid portion of milk) left in the curds (the solid components of milk) after they are cut and cooked, the amount of pressure applied to them and, more importantly, how long the cheese is aged.

the milkfat in cheese melts just below body temperature. Milkfat completely melts in the mouth, which contributes to a smooth mouthfeel. Additionally, milkfat affects mouthfeel by contributing to perceived moistness and smoothness of texture.

## Cheese Classification by Moisture Level

Cheese varieties are classified primarily by their moisture content, resulting in their degree of hardness. Federal standards of identity have been established for hard grating, hard, semi-soft, and soft classes of cheese. The maximum moisture and minimum milkfat for classes of cheese designated by consistency are given in Table 1.

## Moisture Content in Cheese

Generally speaking, the lower the moisture content, the firmer the cheese. The firmer the cheese, the slower the ripening, the more selective the flora (flavor and aroma) and the longer the shelf life. For example, hard grating cheeses are lowest in moisture and are ripened for long periods of time to obtain the required loss of moisture and desired flavor development. The relatively low moisture content in varieties of hard grating and hard cheeses permits storage for a year or more under favorable conditions. The semi-soft and soft varieties, which have a higher moisture content, are more perishable.

Table 2 groups cheeses into consistencies and classification of cheese based on the federal standards of identity for moisture and fat content.

## Measured by the Mouth

The texture, and consequently the mouthfeel of cheese relates to the type of cheese as characterized by consistency, such as soft, semi-soft, hard, etc. Higher moisture cheese has a smoother mouthfeel than a very hard, grating cheese, which is low in moisture. Higher milkfat cheese also tends to be softer, smoother and/or creamier in the mouth due to the fact that

**Table 2.** Federal standards for maximum moisture and minimum milkfat in selected cheeses.

MILKFAT CHEESE	MAXIMUM MOISTURE (%)	MINIMUM MILKFAT IN SOLIDS (% FDB)	MINIMUM IN CHEESE(%)*
<b>Soft</b>			
Mozzarella	52-60	45	18
Mozzarella (low-moisture, part skim)	45-52	30-45	14
Teleme (soft ripened)	55	50	22.5
<b>Semi-soft</b>			
Monterey Jack	44	50	28
<b>Hard, ripened</b>			
Cheddar	39	50	30.5
Gouda	45	46	25.3
Provolone	45	45	24.8
Swiss		41	43
<b>25.4 Very hard, ripened</b>			
Asiago	34	38	25.1
Dry Jack	32	32	21.8

**TABLE 1.** CLASSIFICATION OF CHEESE BASED ON CONSISTENCY.

CHEESE CATEGORY/CONSISTENCY (FDB)*	MAXIMUM MOISTURE CONTENT (%)	MINIMUM MILKFAT IN SOLIDS (%)
HARD GRATING	34	32
HARD	39	50
SEMI-SOFT	50 (MORE THAN 39%)	50
SEMI-SOFT PART SKIM	50	45 (LESS THAN 50%)
SOFT	NOT SPECIFIED	50

\* FDB (FAT ON DRY BASIS) IS DEFINED AS THE FAT AS PERCENT OF THE MILK SOLID (I.E., 100 LBS. OF MOZZARELLA OF WHICH 60 LBS. IS WATER AND 22 LBS. FAT. THE WATER WEIGHT NEEDS TO BE SUBTRACTED FROM THE TOTAL WEIGHT WHICH LEAVES US WITH 40 LBS. THEN AS FDB IS DEFINED, DIVIDE FAT (22) INTO SOLIDS (40) AND THE RESULT IS 55%).

\* Minimum milkfat in cheese (%) can be defined as the true minimum fat content that cheese must contain (i.e., 100 lbs. of Mozzarella must contain not less than 18 lbs. of fat).



## Nutrients in Cheese

The nutrient content per serving of selected cheeses is given in Table 3. All cheeses are good sources of protein — providing all essential amino acids needed for growth and tissue repair. Real California Cheeses also provide important nutrients such as vitamin A, calcium, and essential fatty acids. The only carbohydrate found in milk also present in cheese is lactose, or milk sugar. Most of the lactose in milk is lost during cheesemaking. The majority of hard and semi-soft cheeses contain less than 1 gram of lactose per ounce of cheese. This is typically in such small amounts that it does not affect most people with lactose sensitivity. However, processed cheese products (products that state processed cheese or processed cheese food on the label) usually do contain lactose because of the way they are manufactured.

## Cheese Handling and Storage

Except for fresh unripened cheeses, most cheeses are ripened to some degree to develop flavor. Cheeses ripened for up to three months are classified as mild; three to six months as medium; and more than six months as aged. Federal regulations require that cheeses made from raw milk must be ripened for a minimum of 60 days at temperatures not less than 35°F before consumption.

Storage temperature is important to flavor development. Cheeses held at high temperatures ripen faster than those held at low temperatures. Cheeses purchased for consumption must be stored at temperatures between 42 to 50°F in airtight containers to maintain freshness and flavor. Once cheese is taken from its original package it must be re-wrapped tightly in

plastic bags or wrap, wax paper, or aluminum foil. Unripened fresh cheeses, e.g., fresh water-packed Mozzarella, must be used as soon as possible.

Most mold that develops on natural aged cheese is harmless. Remove it by simply cutting 1/4–1/2 inch beneath the mold and use the cheese as soon as possible. If a piece of cheese has become quite moldy (more than one or two small spots), it's best to discard it.

## Freezing Cheese

The freezing point of cheese depends on its age, moisture and salt content. Aged cheeses have a lower freezing point. The flavor of aged cheeses is not affected by freezing. However, freezing can have a negative effect on body and texture. Cheeses such as Mozzarella, Cheddar, Gouda, Provolone, and Dry Jack may be frozen for 6 weeks or more. For best results, cheese to be frozen must be less than 1 pound or not more than one-inch thick. Some Real California Cheese varieties are available pre-shredded, but other specialty cheeses will come in large blocks or wheels must that be cut into smaller pieces before freezing. The cheese must be wrapped in an airtight package to prevent moisture loss. It is best to use foil or plastic wrap designed for freezing. Cheese must be frozen as quickly as possible, slow freezing causes cheese to become crumbly.

Frozen cheese is best thawed slowly in a refrigerator. When cheese is removed from frozen storage, it may appear uneven in color. But, after complete thawing, the normal color of the cheese will return. Cheese that has been frozen should be used as soon as possible after thawing. Cheese that has been frozen and thawed should never be refrozen.

**Table 3.** Comparative nutrient content per serving of selected cheeses.

CHEESE TYPE (MG)	SERVING SIZE	WATER (G)	CALORIES (KCAL)	PROTEIN (G)	FAT (G)	LACTOSE (G)	SODIUM (MG)	CALCIUM
Asiago	1 oz (28g)	8.76	110	9.02	7.64	1.03	340	302
Brie	1 oz	13.73	95	5.88	7.85	0.13	178	52
Cheddar	1 oz	10.42	114	7.06	9.40	0.36	176	204
Dry Jack	1 oz	8.27	111	10.14	7.32	0.91	454	336
Edam	1 oz	11.78	101	7.08	7.88	0.40	274	
207 Fontina	1 oz	10.75	110	7.26	8.83	0.44	224	156
Gouda	1 oz	11.75	101	7.07	7.78	0.63	170	198
Monterey Jack	1 oz	11.63	106	6.94	8.58	0.19	152	212
Mozzarella	1 oz	15.35	80	5.51	6.12	0.63	106	147
Mozzarella (low moisture)	1 oz	13.72	90	6.12	6.98	0.70	118	163
Mozzarella (low moisture part skim)	1 oz	13.77	79	7.79	4.85	0.89	150	
207 Mozzarella (part skim)	1 oz	15.25	72	6.88	4.51	0.78	132	183
Panela	1 oz	14.2	90.2	5.8	7.1	0.85	178	180
Provolone	1 oz	11.61	100	7.25	7.55	0.61	248	214
Swiss	1 oz	10.55	107	8.06	7.78	0.96	74	272
Teleme	1 oz	14.6	84.2	5.37	6.69	0.61	202	140

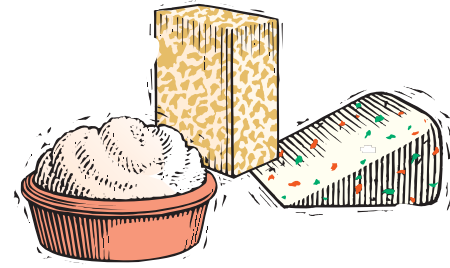


## What Meltability REALLY Means

The most traditional cheese used on pizza is Mozzarella and other cheeses that have great elasticity and stretch when cooked or heated. With so many Real California Cheeses available for topping pizza, the varieties may be purchased in blocks or in cut, diced, or shredded form. When cheese is purchased in blocks or wheels, it must be shredded or grated before being used as a pizza topping. Thoroughly chilled cheese grates and shreds better than cheese kept at room temperature. Grated or shredded cheese melts more readily than a block.

The stretching and melting properties of cheeses are important characteristics influencing its use on pizza. Table 4 shows the flow properties of some Real California Cheese varieties. The melt distance (in millimeters) measures the relative flow or stretchability of cheese when heated. In other words, the melt distance shows how much the cheeses will melt and/or stretch relative to each other when heated. Some cheeses melt better than others. For example, Monterey Jack, Cheddar, Gouda, and Provolone have melting properties similar to Mozzarella, but offer varied flavors to the traditional pizza. Brie, Feta, and Panela have little or no melting properties, yet complement the standard toppings.

For cooking, remember that most cheeses respond best to low and medium temperatures for a minimum amount of time, just long enough to melt the cheese and blend it with the other ingredients. A relatively high temperature or a prolonged period of cooking causes the cheese to breakdown resulting in a stringy, rubbery product.



## Pick a Flavor, Any Flavor

Different ingredients and processes employed during the making and aging of cheese result in a wide variety of available cheeses, each with its own distinct texture and flavor profile. For example, the nutty flavor of Swiss and Gouda, the sharpness of Cheddar and Dry Jack, or the tanginess of Teleme added to the creaminess of Mozzarella allow for many new pizza creations. The milkfat in cheese is an excellent background flavor and it also carries other flavors. Its low melting point ensures complete flavor release. A spectrum of flavor profiles delivered by cheese is depicted in Table 5.

Cheese, especially softer varieties, combines well with other ingredients, particularly fat-soluble ingredients (fats and oils, flavorings, oil-based spices such as oregano), spices, herbs and sweet flavors. In such combinations, cheese serves as a carrier and evenly distributes the flavorings throughout the product.

**Table 4.** Relative melt distance for selected cheeses.

CHEESE	MELT DISTANCE (MM)	CHEESE	MELT DISTANCE (MM)
Asiago	10.0	Monterey Jack	8.4
Brie	0	Mozzarella	6.4
Cheddar	5.0	Panela	2.5
Edam	3.5	Provolone	6.2
Feta	0	Smoked Gouda	<0.5
Fontina	7.0	Swiss	6.0
Gouda	6.1	Teleme	2.0

**Table 5.** Desirable flavor profiles in cheese.

FLAVOR TERM	DESCRIPTION	EXAMPLE CHEESES
Creamy	Rich, resembles heavy cream	Brie, Mozzarella
Milky	Fresh milk flavor	Mozzarella (water-packed), Monterey Jack, Panela
Nutty	Nut-like flavor	Edam, Gouda, Swiss
Pickled	Salty, due to brine	Feta
Piquant	Sharp bite	Cheddar, Dry Jack, Asiago
Sharp	Biting, but not excessively acidic	Cheddar, Dry Jack, Asiago
Smoky	Smoke flavor obtained from the addition of liquid smoke or by smoking over wood chips	Provolone, Smoked cheeses
Tangy	Pleasing acidity or tartness	Teleme, Swiss

Visit our Web sites at

**[www.RealCaliforniaCheese.com](http://www.RealCaliforniaCheese.com)**

for more information about Real California Cheese and pizza.



## **Pizza Makers Information Guide to** *Real California Cheese*

California has long been known as a hot-bed of culinary innovation and this is especially true in its pizza kitchens. Over the past few years, California pizza makers have earned a reputation for transforming the look and taste of the traditional pizza pie. Today's creative pizza makers use toppings from seafood to roasted nuts, even sliced fruit! The growth of California's specialty cheeses has helped pave the way for these innovative pizza creations.

With more than 250 varieties and styles of cheese produced in California, it's no wonder that many are perfect for topping pizza. With so many choices of Real California Cheese (RCC), the options and combinations are endless. The California Milk Advisory Board (CMAB) has created this information guide to help you better understand RCC and how this quality ingredient can help you make your best pizza ever.





# A Selection of Real California Cheeses

## MOZZARELLA

Most commonly used on pizzas because of superior melting and stretching ability. A white cheese with delicate, mild flavor, can be found as semi-hard or in fresh varieties.

## MONTEREY JACK

Semi-hard creamy white cheese with semi-firm to firm texture and smooth, mild flavor. Comes in flavored varieties such as hot pepper, jalapeño, garlic, onion and pesto. A California original.

## BRIE

Mild, rich soft-ripened cheese with an edible white rind. Brie has a soft, creamy white interior that becomes more flavorful as the cheese ages.

## SWISS

A mild, pale yellow cheese with a tangy, sweet, nutty flavor. Best recognized by the holes or eyes that develop as the cheese ripens.

## DRY JACK

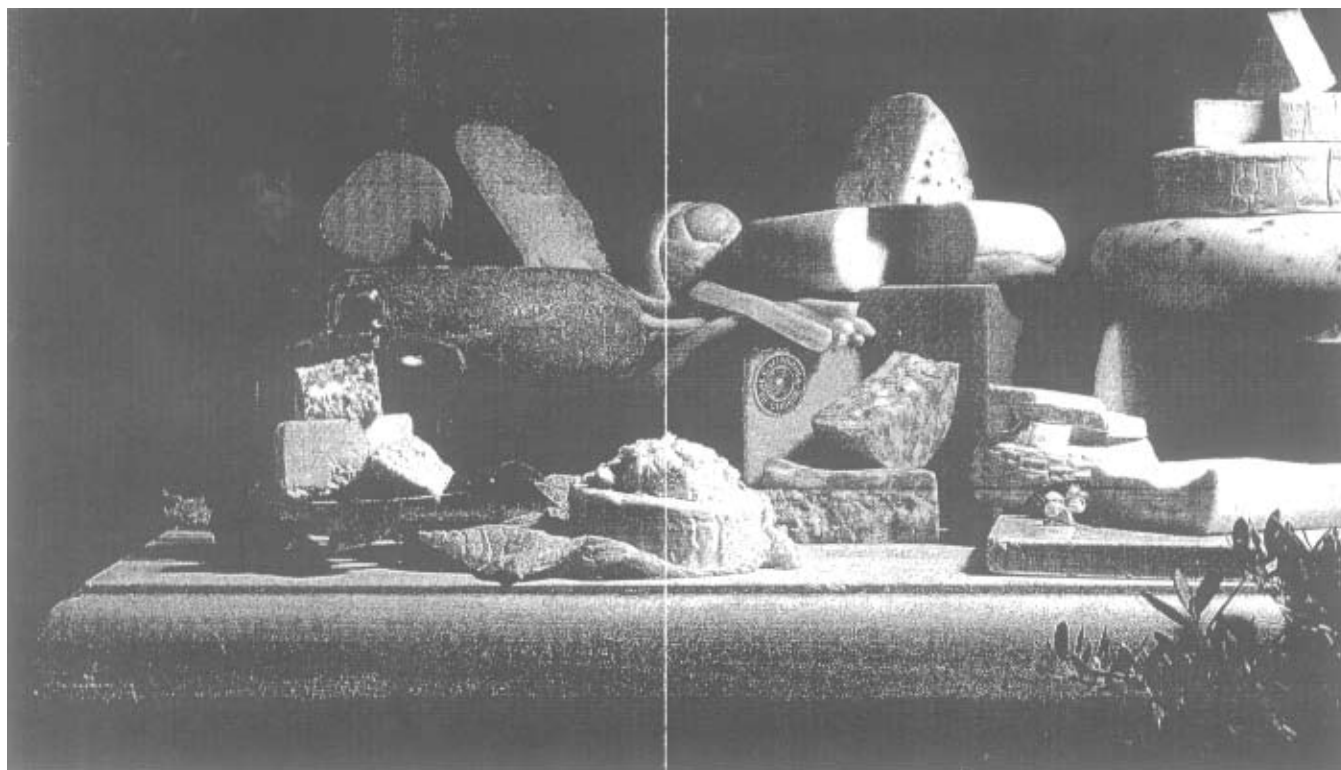
Very hard, aged dry version of Monterey Jack with delicious nutty flavor. An excellent replacement for Parmesan and a California original.

## ASIAGO

Piquant, sharp light yellow, Italian-style cheese that can be hard to very hard in texture depending on age, similar to Parmesan.

## OAXACA

A firm white Hispanic-style cheese with a mild, sweet milky taste. Similar to Mozzarella and is distinguished by its distinctive, braided appearance.



## EDAM

Semi-hard mild yellow cheese with firm texture that is similar to Gouda.

## FETA

A salty, pungent white cheese with a dry, crumbly firm to hard texture.

## PANELA

Mild, firm, white Hispanic-style cheese with sweet milky flavor.

## GOUDA

Semi-hard creamy yellow cheese with firm texture and mild, nutty flavor.

## PROVOLONE

Hard or semi-hard light yellow cheese with flavor ranging from mild to sharp to smoky.

## CHEDDAR

Cheddar describes a family of very popular and versatile cheeses available in a range of flavors from mild to very sharp.

## FONTINA

A firm, light yellow, mild nutty flavored cheese, similar to Gouda or Edam. A variation, Fontinella, is firmer and drier.

## TELEME

A mild creamy white cheese with a slightly tangy aftertaste. A California original.