

Chefs



Rahul Akerkar

He says that he became a chef as he went along. This Indian learned about cooking as he worked in different restaurants while studying in New York for a master's in biochemical engineering. There he discovered his vocation in cooking. In 1989 he returned to India where he fully devoted himself to his new passion, and in 1999 opened the Indigo restaurant in Mumbai, which offers Mediterranean dishes with local flavours and styles. Indigo has received a series of international recommendations, including 28th ranking in the 2013 list of "Asia's 50 best restaurants" organized by *Restaurant Magazine*. Akerkar is currently working on a recipe book.



Mauricio Armendaris

This chef is convinced that Ecuador has an extremely rich gastronomy and has been actively retrieving, promoting and internationalizing its flavours in a more modern format. He has written several books with this in mind, including *Mishki Mikuna, el sabor de Ecuador, La cocina del Ecuador and Panes y postres del Ecuador*. This enthusiasm spurred him to become one of the founders of the Association of Chefs of Ecuador, of which he is currently President, and to participate as director in the National Plan for the Development of Ecuador's Culinary Heritage.



Jenna Beaugh

Chef and seasoned blogger, her current passion for writing recipes started from her obsession with cookbooks when she was only 10 years old. She could spend hours leafing through cookbooks or watching her mother cook. Jenna is the creator of the site *Eat, Live, Run*, where she posts recipes and stories of travel and life. She is also the author of the book *White jacket required*.



Matthew Boland

He is one of the best known chefs of Aruba and is in charge of the menus of the various restaurants of the Westin Aruba Beach Resort & Casino, where he has had the privilege to cook for participants at the Pan American Conference on Obesity (PACO). During the course of his career he has worked with the famous New York chefs Daniel Boulud and Tom Valenti. A key feature of Boland's cuisine is his insistence on fresh produce, preferably sourced locally. When not working in the kitchen of prestigious restaurants, this chef has presented television programmes, some specifically for children.



Joseph Brozovich

Bolivian chef. He began his career in Peru, in the Cordon Bleu of Lima, where he witnessed that country's gastronomic revolution, an experience that inspired him. After finishing his studies he worked for a while in Bolivia and attended internships in Denmark. After returning from Europe, he and three partners decided to set up the restaurant Aji Gusto, which seeks to highlight Bolivian flavours and ingredients and is already well known in La Paz. This year he was also given responsibility for the inaugural luncheon for the International Year of Quinoa, held at UN headquarters in New York and attended by President Evo Morales and UN Secretary-General Ban Ki Moon.



Mauro Colagreco

Argentine by birth, this chef has forged his career and fame in France. After working in prominent French restaurants for almost five years, in 2006 he settled in Menton, on the French Riviera, with his own restaurant, Mirazur. His venture was a resounding success. He was recognized in France by the Gault et Millau guide in 2007 and 2009. He is also known internationally. His restaurant today has two Michelin stars and in 2013 was selected as one of the 28 best restaurants in the world in the "World's 50 best restaurants" list produced by the *Restaurant Magazine*.
Photograph by: Per-Anders Jorgensen



Maria José Coloma, Shelly Johnston y Ryan Gorczycki

Nutritionists and members of the team working on this cookbook. Maria José Coloma (in the photo) is Chilean and is currently working as a nutrition consultant with the FAO Regional Office for Latin America and the Caribbean. Shelly Johnston and Ryan Gorczycki are young US citizens on internships as members of the International Year of Quinoa team.



Enrico Crippa

He is one of today's best known Italian chefs. His career began under the influence of the best European chefs: Gualtiero Marchesi, Christian Willer, Ghislaine Arabian, Antoine Westermann, Michel Bras and Ferran Adrià. After spending a few years in Japan, an experience that was crucial for his cooking, in 2005, he and the Ceretto family opened the Piazza Duomo in Alba, Italy. This restaurant is internationally renowned. It has three Michelin stars and in 2013 the *Restaurant Magazine* classified it among the 41 best restaurants in the world.



Teresa Cutter

She is one of Australia's leading authorities on healthy cooking and is founder of the company The Healthy Chef. Teresa is a chef trained in traditional French cuisine, a nutritionist and a fitness trainer. She has written five books on healthy cooking, the most recent being *101 Ways to Lose Weight and The 80/20 Diet*, both with successful sales on iTunes. Teresa writes columns with recipes and nutritional information for the *Sun herald* and the magazines *Women's fitness*, *Men's fitness and House & garden*, and has appeared on numerous cooking segments on television.



André Chiang

A young French trained Taiwanese chef now established in Singapore, André Chiang's cuisine has been influenced by his many years spent in the kitchens of French nouvelle cuisine maestros. At Restaurant ANDRE, the cuisine reflects Chef André's culinary principle - Octaphilosophy - based on eight characteristics: Unique, Texture, Memory, Pure, Terroir, Salt, South and Artisan. Namely 8 dishes thoughtfully combined to engage all the senses. Since its opening in 2010, Restaurant ANDRE has been celebrated by many including The New York Times. In 2013, the restaurant achieved position 38 in the World's 50 Best Restaurants list 2013 by *Restaurant Magazine* and has been proclaimed one of the best restaurants in Asia.



Quique Dacosta

This Spanish chef is considered to be in the vanguard of Spanish cuisine. His Mediterranean cooking starts from tradition but then breaks new ground through research and creativity. His restaurant Quique Dacosta has received a stream of awards, including three stars from the *Michelin Guide* and features in the list of "World's 50 best restaurants", produced by the *Restaurant Magazine*. He has also been awarded an honorary doctorate in fine arts from Miguel Hernández University. Part of his art is recorded on a CD-ROM and in three books, one of which *Arroces contemporáneos* has just been issued in fourth edition.



Débora Fadul

Young chef from Guatemala. She is owner of the catering company Chef de Mon Coeur, which services some of the principal companies of the country. Her policy is to prepare the dishes when they are about to be consumed, with fresh ingredients. Debora has written columns for various Guatemalan media, including *El Periódico*, the magazines *Look magazine*, *Mis hijos y yo* and *Salud y vida*. She also presents the *Cosina Kreativa* segment of the *Matutino express* programme on Guatemala's Canal Antigua.



Dolli Irigoyen

Chef and television presenter recognized in her native country, Argentina, and throughout Latin America. Dolli has produced several television programmes of Elgourmet.com and has published the books *Dolli cocina para todos* and *Dolli Irigoyen en su cocina*. She has received countless awards during the course of her career, notably the Santa Clara de Asís and the Martín Fierro for the best cookery cable programme on Argentine television.



Citrum Khumalo

South African chef, media personality and one of the public faces of South African cuisine in the world. Although he started from the bottom, in the cleaning staff of a restaurant, he rapidly rose through the kitchens. He now has his own catering company, a programme on the Jozi FM radio station and is widely recognized after conducting cookery programmes such as *Chef in my kitchen*, *Whip the chef* on SABC 2 channel and *Boy meets grill* on SABC 1. He is founder of the Culinary Arts Association of South Africa (C.A.A.S.A) and is currently its President. He is also the president of African Chefs united (A.C.U).



Juliana Lopez

Argentine chef, presenter of cookery programmes and an authority on healthy organic food. She began her career at the age of 19 years, under Francis Mallmann, before travelling the world, which included a stint at the acclaimed River Café restaurant in London. Juliana made a number of programmes on El Gourmet, including *Naturalmente Juliana*, *La Huerta en tu casa*, *Good food* and *Ligero y liviano*. She is also the author of the cookbooks *Mi primer libro de recetas*, *Recetas compartir* and *Gatu-rriquisimo*.



Chef McDang

His name is Mom Luang Sirichalerm Svasti, born into the royal family of Thailand but known in Asia as Chef McDang. His education and early career took place in the US. In 1993 he decided to return to his country of birth where he rapidly became a public face. There he published books such as *The principles of Thai cookery and Delicious Food from McDang's Kitchen* and made various television programmes, the last being the *McDang show* which is broadcast on 9 MCOT channel. This chef also writes columns for the Daily News Thailand and CNNGo. His wealth of experience has earned him the title of Ambassador for Thai Cuisine.



Morten Nielsen

Of Danish nationality, this chef is a self-confessed lover of Thai cooking. His relationship with this cooking began in 2004, when he worked in the famous restaurant Nahm in England, and was consolidated in 2007 when he joined the restaurant Kiin Kiin, in Denmark, as head chef. In 2011, he finally travelled to Thailand and became head chef of Sra Bua by Kiin Kiin, a restaurant that offers Thai-inspired cuisine with a modern flair, and that was classified as one of the 29 best in Asia in the "Asia's 50 best restaurants" list produced by *Restaurant Magazine*.



Alfredo Oropeza

Chef famous in Mexico and the rest of Latin America, where he promotes healthy cooking and wholesome habits. This cause is reflected in four best sellers, including *La nueva cocina saludable del Chef Oropeza*, and in his television programmes. Oropeza has worked with the US Food Network, the Elgourmet.com channel and for four years with Televisa's Canal de las Estrellas (Channel of the Stars). He is currently presenting his own programme *Chef Oropeza en casa*, broadcast through Unicable.



Matías Palomo

Mexican by birth but a nomad for much of his professional life. His early days as chef took him to famous kitchens, such as those of the restaurants Arzak and El Bulli in Spain, and Daniel in New York. In 2006 he arrived in Chile and opened the restaurant Sukalde, with a menu that revives forgotten or little known Chilean products. *The Food & wine* magazine recommended Sukalde in its Go List for the year 2008 and *Forbes* magazine praised its gastronomy in 2011. Matías also has wide experience in television: he presented *Se Cocina al fin del mundo and varietal* (Canal 13 cable).



Amir Pasha Sarvi

Iranian chef. His love for cooking began at home in a rural area 40 kilometres from Teheran, where he watched his grandmother and mother cook. This love was so strong that he decided to give up his computer studies and set up the catering company Pasha Food Studio in Teheran. This chef likes to use traditional Iranian ingredients sourced directly from the countryside. Pasha is currently filming a television programme in which he uses traditional ingredients in a modern and healthy style of cooking.



Juan José Peralta

Bolivian chef with an extensive career. He was charged with catering for the President of Bolivia, Evo Morales, during the launch of the International Year of Quinoa in New York, US. He began in the kitchen under the auspices of his father a former hotel chef who worked in many of the hotels of La Paz. After working in various restaurants and cafeterias of La Paz, including the La Paz Tennis Club and Bistrot Alliance Française, Juan José concentrated on culinary training; first in the Commercial Technical Institute of La Paz and then with the Programme of Productive Technical Education of Uyuni, Potosí, financed by the Fautapo Foundation.



Adolfo Perret

Executive chef of the Punta Sal restaurants and one of the public faces of Peruvian gastronomy in the world. He has been appointed to prepare delicacies for high-level political meetings and has participated in television programmes with cookery segments, such as those of the Utilísima channel or in *Realza tu sazón con Inca kola*, *Hola Perú*, and *Hombres trabajando para ellas*. He is currently director of the Peruvian Society of Gastronomy (APEGA).



Rose Reisman

She is a promoter of healthy food and lifestyle. This Canadian author has written 18 books with more than two thousand recipes and information on nutritional trends, weight control and the prevention of chronic disease. She participates in radio and television programmes and writes columns in news media such as *The Huffington post Canada*. She is also owner of the company Rose Reisman Catering and Personal Gourmet.



Joan Roca

He is the eldest of the three Spanish brothers who founded the famous restaurant El Celler de Can Roca, considered the best in the world in 2013. Joan trained under big names of world cuisine such as Ferran Adrià, Santi Santamaría and George Blue. The dishes produced by the Roca brothers are a combination of Catalan tradition and modern culinary techniques that seek to exhilarate their customers.



Laura Rosano

What inspires and moves this Uruguayan chef, member of the Slow Food movement, is cooking with local products and methods, organic foods and flavours that are as natural as possible. She started in gastronomy in Sweden and Holland. She is currently co-director of Verde Oli-va, a company specialized in the design of workshops on food education and in research and promotion of regional cooking and native fruits. Laura is also the author of the *Recetario de frutos nativos del Uruguay* and one of the chefs previously collaborating with the cookbooks of Chefs Against Hunger.



Lorenzo Rosso

Born in Italy, this man is in love with Thailand. He is married to a Thai and is currently executive chef of the Hotel Millennium Hilton Bangkok. He started his career in Asia as executive chef of the Hotel Sofitel Raja Orchid Khin Kaen in 1997. The moved to the Hilton Hua Hin Resort & Spa in 2000 and took up his present position in 2005.



Chris Salans

The style of this chef reflects a combination of cultures. The son of a French mother and a North American jewish father, but his heart lies in Indonesia where he settled and opened a restaurant called Mozaic. His cooking has received many awards. He is recognized as the best restaurant in Indonesia, is listed in the “Asia’s 50 best restaurants” list of *Restaurant Magazine*, and was classified as fifth best restaurant in Asia by the *Miele Guide*.



Flávio Solórzano

Specialized in Peruvian cuisine, pastry and artisanal ice cream, this chef is known for having drawn the world's attention to Peru's cuisine. Solórzano began in his mother's restaurant, El Señorío de Sulco, where he continues to delight his customers and which he and his brothers have elevated to one of the most prestigious of Peru. This chef is also known on cookery segments of Peruvian television. He is a founding member of the Peruvian Society of Gastronomy (APEGA) and a former collaborator of Chefs Against Hunger.



Darwin Torres

Born in Venezuela, but with cookery experience gained in the Caribbean, in Puerto Rico and then Aruba, where he has worked for 16 years. He has been chef in places like the restaurants Sunset Grille del Radisson Aruba and Mr. Jazz. He was assistant chef in the Hotel Riu Palace and is now assistant to the executive chef of the Westin Aruba Beach Resort & Casino. The type of cuisine that attracts him most is fusion.



Takahiro Tozawa

When a Peruvian friend introduced this Japanese chef to quinoa in 2007, the grain was unknown in his country, nor was there much information on it on the internet. His passion for quinoa and its benefits led him to create a web site in Japanese, with information and recipes using ingredients available in Japan.



Claude Troisgros

French by birth, son of the famous Pierre Troisgros, this chef has lived for more than 30 years in Brazil, which has given his cooking a unique blend of Brazilian flavours and ingredients, such as cashew and açaí, with classics such as foie gras, caviar and soufflé. Troisgros is known in Brazil through his television programme *Que maravilha!*, broadcast on Canal GNT, and his most famous restaurant, the Olympe in Rio de Janeiro which has made him world renowned, was recognized as one of the best 50 restaurants of Latin America, according to *Restaurant Magazine*. Troisgros has been nominated 'Chef of the Year' by leading Brazilian magazines such as *Veja*, *Gula* and *Guia Quatro Rodas*.



Thomas Troisgros

The fourth generation of a family of chefs, the son of Claude Troisgros and grandson of Pierre Troisgros. He has been cooking since he was 10 years old. He began in France in the family kitchens and then under Daniel Boloud in New York, and two of Spain's most famous chefs, Andoni Aduriz and Juan Mari Arzak. He and his father currently run the restaurants Olympe, CT Trattorie, Brasserie CT and CT Boucherie, all in Rio de Janeiro. In 2009, Thomas was awarded a prize as 'Revelation Chef' by the Brazilian magazine *Veja Rio*.



Malika van Reenen

Executive chef of the Signal restaurant, in Cape Town, South Africa, where she has worked for the last five years. Her roots run deep in Cape Malay culture and traditions, which have been present in Cape Town for centuries. With Malika in charge of the kitchen, the Signal restaurant has gained prominence in Cape Town, winning awards such as the Master of the Trade Routes and the Best Dish Award at The Taste of the Cape Town.



Rubén Vega

Executive chef of the Hotel Palace Guayaquil of Ecuador. He has worked as advisor to various hotel corporations including Hilton, Sheraton and Marriott. He has also taught at the University of Guayaquil and at the School of Gastronomic Sciences of the Universidad de Especialidades Espíritu Santo (UEES) of Guayaquil.



Galo Villa

Ecuadorian chef specialized in bakery and chocolate making. He teaches pastry and chocolate making at the Cruzada Social in Riobamba. He is academic director of Río Gourmet Alta Cocina y Hotelería and general manager of the Río Gourmet group. He won silver medal of the Latacunga culinary cup 2012 and the Riobamba culinary cup 2013.



Frank Villablanca

This Chilean was one of the first members of the Chefs Against Hunger alliance and is one of the most active, contributing delicious creations to two of its cookbooks. Frank has vast experience of the culinary diversity of Chile's regions and is a passionate promoter of Chilean gastronomy, representing the national cuisine in assorted Latin American culinary festivals. His style of cooking is simple and minimalist, an approach that he has instilled in the restaurants and hotels in which he has worked, including the Hotel Radisson of Huechuraba and the Hotel Manquehue.



Carlo von Mühlenbrock

He is perhaps one of the most popular chefs on Chilean television, a champion of healthy eating and one of the promoters of world awareness of Chilean produce and gastronomy. He has worked on different Chilean television channels and today reaches into Chilean homes with the programme *Carlo cocina* on CNN Chile. This chef has written several books, including *Cocina fácil* and *Manos del sur*. He is also a partner of the Restaurante Osadía and one of the public faces of the Chilean Government's Elige Vivir Sano (Choose Healthy Living) campaign that seeks to promote healthy lifestyles.

Communities



PROINPA Foundation (Bolivia)

The Foundation for Promotion and Research of Andean Products, PROINPA, is a non-profit science and technology institution that has three central objectives to benefit agricultural producers and society as a whole: to promote the conservation and sustainable use of genetic resources; to contribute towards food sovereignty and security; and to foster the competitiveness of agricultural sectors of national priority.

The recipes received for this cookbook result from training given by PROINPA and the McKnight Foundation on “diversification of uses of quinoa and cañahua based on their flakes”, and from the recovery of traditional forms of preparation in partnership with farmers of the communities of Jalsuri, Contorno Letanías, Charahuayto, Callisaya, Canaviri, Chojasivi, Quiripujo y Lacaya, Coromata Media, Cachilaya, Titijoni, Santiago de Okola and Cariquina Grande.



Wiñay Warmi Association (Peru)

Wiñay Warmi, which means “growing women” in Quechua, is the name chosen by 15 women from the Puno region who decided to form a gastronomic association dedicated to quinoa in the year 2007. This group emerged from training given through the Project to Strengthen the Economic Participation of Rural Women in Puno, executed by the Manuela Ramos Movement and financed by Andean Development Corporation (CAF) and Italian Cooperation. Some 60 women were involved in the training and 15 of these decided to set up a business activity based on this Andean grain.

The partners of Wiñay Warmi shared their know-how and produced a cookbook entitled “El camino de la quinua”, published by the Manuela Ramos Movement. In this way Así Wiñay Warmi managed not only to earn income for its members, but also converted them into ambassadors for the promotion of this golden grain.



FAUTAPO Foundation (Bolivia)

The Foundation for Development, FAUTAPO, is the institution responsible for coordinating and facilitating the implementation of the COMPASUR programme whose primary objective is to support the production of organic royal quinoa of the southern highlands of Bolivia. Its intervention includes the promotion of this emblematic product of Bolivia at national and international level in order to increase its consumption. Culinary experiences have been revived for this purpose to demonstrate the properties of quinoa and its versatility in the preparation of food.



Community of Laguna de San Martín (Ecuador)

Laguna de San Martín is a community in the canton of Riobamba, parish of Quimiac, in the province of Chimborazo. Its inhabitants are farmers producing traditional Andean foods such as oca, mashwa, melloco, fava bean and especially quinoa. They also grow potatoes and pasture, raise guinea pigs and breed dairy cattle.



Community of Guadalupe (Ecuador)

Guadalupe is a community in the canton of Riobamba, situated at 3400 masl at the foot of grasslands in the parish of San Juan, in the province of Chimborazo. Its inhabitants are farmers producing traditional Andean foods such as fava bean, oca, mashwa, melloco, potato and non traditional commodities such as barley. They also grow pasture and raise dairy cattle.

Glossary

Agar: Vegetable gelatin made from seaweed.

Alholva (*Trigonella foenum-graecum*): Plant from southeast Asia whose leaves and seeds are used in cooking because of their aromatic properties.

Andigena potatoes (Papines andinos) (*Solanum tuberosum subespecie andigena*): The Andean potato is a collection of cultivars native to the Andean region of South America. These potatoes have different shapes and attractive colours. The small size tuber is known as ‘papín’.

Annatto oil: A condiment made from the seeds of the *Bixa Orellana* plant. It has an intense orange, almost red, colour. It is made by heating two tablespoons of seeds in a cup of oil until they begin to bubble.

Avocado: Fruit of the *Persea Americana* plant.

Basmati: Long-grain rice grown in India and Pakistan.

Barberries: Fruit of the *Berberis vulgaris* plant. These berries are an important ingredient in Iranian cooking.

Brunoise: Type of vegetable cut, consisting of small cubes with sides of about 5 millimetres.

Bulgur: Also known as bulghur, burghul and cracked wheat. This is a food obtained from precooked cracked wheat. It is common in the Middle East and North Africa.

Cane honey (miel de caña): Cane sugar syrup.

Cayenne pepper: Powder of dried chillies. Can contain powder of one or more species of chilli.

Chive (*Allium schoenoprasum*): This plant has a smaller bulb than an onion. Its stem is used.

Chuño: Powder obtained from the dehydration and subsequent grinding of a potato.

Coloured lard: Pork lard spiced with paprika and other varying ingredients, such as meat, oregano, bay leaf and vinegar.

Coulis: This is a type of sauce from French cuisine. Its terminology has changed as cooking has changed: what was originally the thickened juice of cooked meat giving body and flavour to sauces has also become a sweet or savoury sauce or puree of fruits or vegetables, produced through cooking, marinating etc. Today, the most popular coulis are made from fruit and are used to accompany desserts, such as the traditional strawberry or red fruit coulis served with cheesecake and vegetable coulis (also fruit) served with meat and fish.

Crème fraîche: Dairy cream with an acidic taste. It is less bitter and has more fat than “sour cream”. It is made by injecting *lactobacillus* cultures into unpasteurized light cream.

Fennel (*Foeniculum vulgare*): Aromatic herb used in gastronomy.

Glaze: A sweet or savoury substance applied as a glossy decoration.

Green bean: Pod of the *Phaseolus vulgaris* plant. It is flat and elongated, contains seeds and is normally eaten cooked.

Guaviyu: Fruit of the *Myrcianthes pungens* tree. The berries are small, violet and with one or two large seeds. The flesh is greenish yellow, firm, very sweet and juicy.

Jaggery: coffee-coloured block of unrefined sugar made from sugarcane juice consumed in Asia and Africa. Similar to panela in appearance but different in taste.

Kaffir lime: Fruit of the *Citrus hystrix* tree, commonly used in southeast Asian cuisine. Its juice and skin are used.

Kumquat: Small citrus fruit with an edible skin.

Leek (*Allium ampeloprasum* var. *Porrum*): This vegetable has a bulb like garlic but larger.

Maple syrup: Syrup made from maple sap. Commonly used in US and Canada.

Maracuja (passion fruit): Fruit with a yellow, orange or violet skin grown in much of America.

Masala: A term used in south Asian countries to refer to a mix of spices. The mix can be dry or a paste.

Matcha green tea: Ground green tea.

Microgreens: Vegetables with approximately two weeks of life produced in sterile soil and a container with drainage. Their growth requires sunlight, good air circulation and continuous irrigation. The most common vegetables grown this way are kale, spinach, cress, rocket and broccoli.

Morocho maize: Dried maize.

Naranjilla: Fruit of the *Solanum quitoense* plant, typical of the Andean region. Its peel is yellow, orange or brown and is covered with hairs. It has an acidic taste and is used in juices, jams and desserts.

Panela: In America this is also known as raspadura, atado dulce, chancaca, empinzao, piloncillo, tapa de dulce, papelón and panocha. It is a solid piece of coffee-coloured unrefined sugar normally obtained from cane sugar. It is very common in South America, India and Pakistan.

Paprika: Red powder resulting from the drying and grinding of specific varieties of red peppers.

Pearl onion (*Allium proliferum*): Small sweet onion, also known as cocktail onion.

Pepper: Fruit of the shrub *Capsicum annuum var. Annuum*.

Racacha (*Arracacia xanthorrhiza*): Andean plant whose root is eaten.

Rawas (*Eleutheronema tetradactylum*): Also known as rahu, rehu, roí, rui or rou. This is a white fish popular in India, Thailand and Pakistan.

Rocket (*Eruca sativa*): Vegetable normally consumed as a salad.

Shallot (*Allium ascalonicum*): Plant similar to the onion but with a mild sweet bulb, between onion and garlic.

Spring onion (*Allium fistulosum*): A plant similar to an onion with a small bulb.

Tabbouleh: A salad of Arab origin based on cracked wheat.

Vietnamese coriander (*Persicaria odorata*): Common herb in southeast Asia whose leaves are used in cooking. It is similar to mint in appearance and smell.

Wakame: Edible seaweed used in soups and salads.

Conversion tables

OVEN TEMPERATURES

Temperature	Degrees Fahrenheit	Degrees Celsius	British gas mark
Very low	200	95	0
	225	110	1/4
	250	120	1/2
Low or slow	275	135	1
	300	150	2
Warm	325	165	3
Moderate	350	175	4
Moderately hot	375	190	5
Hot	400	200	6
	425	220	7
Very hot	450	230	8
	475	245	9

EQUIVALENTS FOR DIFFERENT TYPES OF INGREDIENT

Cup	Fine powder e.g. flour	Grain e.g. rice	Granular e.g. sugar	Liquid solids e.g. lard	Liquids e.g. milk
1	140 g	150 g	190 g	200 g	240 ml
3/4	105 g	113 g	143 g	150 g	180 ml
2/3	93 g	100 g	125 g	133 g	160 ml
1/2	70 g	75 g	95 g	100 g	120 ml
1/3	47 g	50 g	63 g	67 g	80 ml
1/4	35 g	38 g	48 g	50 g	60 ml
1/8	18 g	19 g	24 g	25 g	30 ml

LIQUID INGREDIENTS BY VOLUME

teaspoon	tablespoon	cup	fluid oz	Mililitre	litre
1/4 teaspoon				1 ml	
1/2 teaspoon				2 ml	
1 teaspoon				5 ml	
3 teaspoons	1 tablespoon		1/2 fluid oz	15 ml	
	2 tablespoons	1/8 cup	1 fluid oz	30 ml	
	4 tablespoons	1/4 cup	2 fluid oz	60 ml	
	5 1/3 tablespoons	1/3 cup	3 fluid oz	80 ml	
	8 tablespoons	1/2 cup	4 fluid oz	120 ml	
	10 2/3 tablespoons	2/3 cup	5 fluid oz	160 ml	
	12 tablespoons	3/4 cup	6 fluid oz	180 ml	
	16 tablespoons	1 cup	8 fluid oz	240 ml	
	1 pt	2 cups	16 fluid oz	480 ml	1litre
	1 qt	4 cups	32 fluid oz	960 ml	
			33 fluid oz	1000 ml	

DRY INGREDIENTS BY WEIGHT

To convert ounces to grams, multiply the number of ounces by 30.

1 oz	1/16 lb	30 g
4 oz	1/4 lb	120 g
8 oz	1/2 lb	240 g
12 oz	3/4 lb	360 g
16 oz	1 lb	480 g

Nutritional value

Details of nutritional value of quinoa

Quinoa has gained world recognition for its nutritional value, most notably for the quality of its proteins. In addition to the quinoa seed, the quinoa leaf is highly nutritious and often compared to spinach for its similar flavour and high vitamin A content (Koziol, 1992). However, this document will focus on the quinoa seed, labelled as ‘quinoa’ in the rest of this text, which is the most available part for consumption. The quinoa seed is unique in that it is eaten in a manner similar to a grain. It is often either cooked and added to soups, or made into flour to be used in bread, drinks or porridges. The following review will cover the nutritional value of quinoa’s proteins, carbohydrates, lipids, minerals and vitamins.

Prior to reviewing quinoa’s nutrition, it is important to examine the basics of the quinoa seed structure as it affects quinoa’s nutritional qualities. The inner part of the quinoa seed is called the perisperm and is rich in carbohydrates, while the outer parts, called the embryo and endosperm, are rich in proteins, lipids, and minerals (Prego et al, 1998). The quinoa seed is surrounded by a cover called a pericarp, which contains saponins. While the saponins in quinoa are not considered toxic, they must be removed during processing to reduce quinoa’s bitter taste (Schlick and Bubenheim, 1996). Quinoa’s saponin quantity often depends on the variety, with varieties low in saponins labelled as sweet, and varieties high in saponins labelled as bitter (Mastebroek, 2000).

Quinoa is remarkable for its protein content amongst other crops. As shown in Table 1, quinoa (16.5 g) is generally higher in total protein than maize (10.2 g) or rice (7.6 g), similar in quantity to wheat (14.3 g), and lower in protein than beans (28.0 g) per 100 grams dry weight.

Quinoa is also a good source of polyunsaturated fats, dietary fibre, iron, magnesium and zinc, making it a nutritious food to include as a part of a balanced diet.

Table 1: Macronutrient contents of quinoa and selected foods, per 100 grams dry weight.

	Quinoa	Bean	Maize	Rice	Wheat
Energy (Kcal/100g)	399	367	408	372	392
Protein (g/100g)	16.5	28.0	10.2	7.6	14.3
Fat (g/100g)	6.3	1.1	4.7	2.2	2.3
Total Carbohydrate (g/100g)	69.0	61.2	81.1	80.4	78.4

Source: *Koziol (1992)*

While quinoa is generally considered to be a nutritious food, it is important to note that, similar to any crop, quinoa's nutrient quantities depend on the soil and cultivation conditions in which it is grown, along with the variety. For example, Koyro and Eisa (2008) found that quinoa's protein content was higher and its carbohydrate content lower as the soil salinity concentration increased, with the protein increasing from 11.7 to 15.9 percent of its dry weight. In addition, a study by Miranda et al (2012) of six quinoa ecotypes from three geographical areas of Chile found the calcium content to range from 77.1 to 211.2 mg per 100 grams dry weight.

Proteins

When compared to other plant foods, quinoa is generally higher in total protein than most grains, while lower in total protein than most legumes (Koziol, 1992). Miranda et al (2012) studied six quinoa ecotypes in three different biogeographical regions of Chile and found the total protein in quinoa to range from 11.3 to 16.1 percent of its dry weight. In addition to quinoa's total protein, it is also important to analyse quinoa's essential amino acid content and the availability of its proteins to verify its overall protein quality.

One of the important nutritional qualities of quinoa is its mix of essential amino acids. There are eight amino acids considered to be essential for both children and adults. When compared to the FAO's recommended scoring pattern for essential amino acid requirements per 100 grams of protein for 3 to 10 year olds, as shown in Table 2, quinoa on average exceeds the recommendations for all eight. In contrast to quinoa, most grains are low in the essential amino acid lysine, while most legumes are low in the sulphuric amino acids methionine and cysteine (Koziol, 1992).

Table 2: Comparison of essential amino acid profiles of quinoa and other selected crops with the FAO recommended amino acid scoring pattern for 3 to 10 year olds (g/100 g protein)

	FAO ^a	Quinoa ^b	Maize ^b	Rice ^b	Wheat ^b
Isoleucine	3.0	4.9	4.0	4.1	4.2
Leucine	6.1	6.6	12.5	8.2	6.8
Lysine	4.8	6.0	2.9	3.8	2.6
Methionine ^c	2.3	5.3	4.0	3.6	3.7
Phenylalanine ^d	4.1	6.9	8.6	10.5	8.2
Threonine	2.5	3.7	3.8	3.8	2.8
Tryptophan	0.66	0.9	0.7	1.1	1.2
Valline	4.0	4.5	5.0	6.1	4.4

a Amino acid scoring patterns for 3 to 10 year old children, adapted from FAO (2013), “Dietary protein quality evaluation in human nutrition”.

b Koziol (1992)

c Methionine + cysteine

d Phenylalanine + tyrosine

Regarding quinoa’s protein availability, Ruales and Nair (1993) examined the difference between raw and washed quinoa to determine the effect of removing quinoa’s saponins, and found that the essential amino acid contents were similar. They also tested the availability of quinoa’s protein in an animal feeding experiment. Ruales and Nair (1992) noted that quinoa (80.8 washed) had a higher biological value of its protein compared to foods such as maize (58.1), soy bean (62.0) and wheat (59.0). This led them to conclude that quinoa could be used as a supplementary ingredient to increase the biological value of certain foods.

Carbohydrates

Quinoa is a good source of carbohydrates, providing approximately 68.8 to 75.8 grams of total carbohydrates per 100 grams dry weight (Repo-Carrasco-Valencia and Serna, 2011). In terms of macronutrients, carbohydrates contribute the most energy to the basic diet and are considered a key factor in energy metabolism and homeostasis within the body (Mann et al, 2007). In a study of four quinoa varieties, Repo-Carrasco-Valencia and Serna (2011) found quinoa’s fibre content to range from 13.6 to 16.0 grams per 100 grams dry weight, with the majority coming from insoluble fibre (12.0 to 14.4 grams).

Lipids

Miranda et al (2012) found quinoa's lipid content to range from 5.9 to 7.2 percent of its dry weight among six quinoa ecotypes. In contrast, beans (1.1 g), maize (4.7 g), rice (2.2 g) and wheat (2.3 g) all contained lower amounts of lipids than quinoa as shown in Table 1 (Koziol, 1992).

Regarding quinoa's fatty acid content, quinoa is high in polyunsaturated fats, with about 50 percent of its lipids coming from linoleic acid, an essential fatty acid, which is an amount higher than in olive or peanut, but comparable to that of soy as shown in Table 3 (Koziol, 1992). The integrity of quinoa's unsaturated fatty acids benefits from its naturally high vitamin E content, which acts as an antioxidant to maintain quinoa's lipid stability (Abugoch James, 2009).

Table 3: Fatty acid content of quinoa and selected foods as a percentage of total fat

	Quinoa	Soy	Peanut	Olive
Saturated Fat				
Myristic (C14:0)	0.2	NR	NR	NR
Palmitic (C16:0)	9.9	9.4	9.3	9.6
Stearic (C18:0)	0.8	4.4	2.0	2.8
Monounsaturated Fat				
Palmitoleic (C16:1)	0.1	NR	NR	NR
Oleic (18:1)	24.5	21.6	44.7	79.4
Polyunsaturated Fat				
Linoleic (C18:2)	50.2	55.2	35.8	7.6
Linolenic (C18:3)	5.4	9.0	NR	0.6

Source: *Koziol (1992)*

Minerals and vitamins

On average quinoa is a better source of minerals than most grains as shown in Table 4. Quinoa's higher mineral content is especially important for people who consume limited amounts of animal foods, which are a primary source of many important minerals such as calcium, iron and zinc (Repo-Carrasco-Valencia et al, 2010).

Quinoa is also a good source of B vitamins riboflavin and foliate compared to other grains, and comparable in amounts of thiamine, but substantially lower in niacin on average (Koziol, 1992; Ruales and Nair, 1993).

As was mentioned in the introduction, the saponins in the pericarp of quinoa have to be removed to eliminate their bitter taste, which affects the mineral content of quinoa after processing. Ruales and Nair (1993) and INIAP (1987) reported potassium losses of 46 and 47 percent, and iron losses of 28 and 52 percent, respectively, after processing, while Koziol (1992) estimated losses of 12 to 15 percent for calcium, phosphorus, iron, potassium, sodium, and zinc. In general, the availability of minerals from all plant foods is poor when compared to animal foods because of the presence of food constituents such as dietary fibre, phytate and oxalate (Schlick and Bubenheim, 1996).

Table 4: Mineral content of quinoa and selected foods, mg/100g dry weight

	Quinoa	Maize	Rice	Wheat
Calcium	148.7	17.1	6.9	50.3
Iron	13.2	2.1	0.7	3.8
Magnesium	249.6	137.1	73.5	169.4
Phosphorus	383.7	292.6	137.8	467.7
Potassium	926.7	377.1	118.3	578.3
Zinc	4.4	2.9	0.6	4.7

Source: *Koziol (1992)*

Summary

Quinoa is considered a nutritious food, based on being a good source of several nutrients. It has a well-balanced mix of essential amino acids compared to most grains and legumes, making it a good source of plant protein. Additionally, quinoa is an important source of polyunsaturated fats, dietary fibre, and minerals such as iron, magnesium and zinc. While quinoa contains important amounts of certain nutrients, it is important to eat it as part of a well-balanced diet to obtain all of the nutrients needed for good health.

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