Pulses

Nutritious seeds for a sustainable future

A journey through all regions of the planet

Brazil • China • India • Mexico • Morocco • Pakistan • Spain • Tanzania • Turkey • USA

And recipes from some of the most prestigious chefs in the world
Pulses

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Acknowledgements

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Our world today faces a tough challenge: ensuring food security while providing a balanced diet for everyone around the globe. The figures are daunting: around 800 million suffer from chronic hunger and roughly two billion live with one or more micronutrient deficiencies. At the same time, over half a billion people are clinically obese.

Overcoming hunger and malnutrition in the 21st century means increasing food quantity and quality, while making sure we produce food sustainably, efficiently and safely. In September 2015, world leaders adopted the 2030 Agenda for Sustainable Development, a plan of action for people, the planet and prosperity. It defines a list of Sustainable Development Goals aimed at ending hunger and malnutrition, as well as eradicating extreme poverty and tackling climate change, among other objectives.

The International Year of Pulses helps to kick off the Agenda. Focusing on seeds for sustainability, FAO wishes to promote actions that will contribute to ending hunger while protecting the environment, the planet and its inhabitants.

Pulses have been an essential part of the human diet for centuries. Yet their nutritional value is not generally recognized and their consumption is frequently under-appreciated. Undeservedly so, as pulses play a crucial role in healthy diets, sustainable food production and, above all, in food security.

This book, Pulses. Nutritious seeds for a Sustainable Future, highlights the benefits of these relatively unknown seeds. Given that pulses come in thousands of varieties, it would be impossible to list them all. Thus, the book focuses on the main families of pulses to whet your appetite. This book illustrates the five
main ways in which pulses contribute to food security, nutrition, health, climate change and biodiversity along with an overview of the production and trade in pulses worldwide.

It also takes you on a voyage around the world to demonstrate how pulses are important historically and culturally, as reflected in today’s cooking. We are honoured to present ten world-class chefs sharing their secrets of both traditional and tasty pulse dishes. We hope these recipes will entice you to try some or all of them and encourage you to include more pulses in your weekly diet.

Throughout the International Year of Pulses, we will continue our efforts in bringing together a wide spectrum of different actors, from diverse sectors, to enhance awareness about pulse production and consumption around the world. Our intention is to create synergies amongst our many and valued stakeholders and to lay the foundation for projects aimed at expanding the role of pulses in sustainable food production.

FAO is disseminating information on pulses in both print and multimedia, as well as hosting events at national, regional and global levels. Through these regional dialogues and global awareness campaigns, we aim to stimulate discussion and information exchange among civil society, farmers, the private sector, researchers, government representatives and policy makers, among others.

Our team of nutrition experts is already compiling a food composition database of pulses as part of the FAO/INFOODS Analytical Food Composition Database providing specific data on pulses, biodiversity and their relation to agriculture and processing.

This year marks the beginning of making pulses a household staple for those people and nations who may not know their incredible properties. At the same time, we have made good progress towards our goal of having pulses enriching the earth and sustaining entire populations. These super foods have been nourishing people since historical records began and a long time before.

So much still needs to be done to end world hunger and provide food security and nutrition for a swelling global population, expected to reach over 9 billion by 2050. But one concrete, promising, sustainable and cost-effective opportunity lies within the tiniest of seeds found in a multitude of plants: Pulses. Seeds for a sustainable future.

José Graziano da Silva
Director General
Part
What are pulses?
You see them each and every day: at the grocery store, the farmer’s market, as side orders served with your favourite dish. So innocuous, or such a staple, they hardly garner a mention except when served as soup on a cold winter’s day. But these tiny, seemingly nondescript seeds or beans or pods... have been packing a power punch for a power lunch since time began; possibly playing the starring role as the harbinger of our very survival as a species. And yet, you have never heard of them. What in the world are Pulses?

Pulses are ancient, very ancient. They are a hearty plant species that has existed for millions of years, a sort of wonder plant that grows in any conditions and climes. It is thought that their domestication could pre-date maize. Found on all four corners of the earth, excluding only the poles and infertile deserts, pulses are grown even in regions with extreme hot and cold climes. But they deserve their pride of place: For many, pulses provide the main source of plant protein. And they are not just good for you, they taste good, too.

Across cultures and cuisines, their culinary versatility has given rise to a host of delicious recipes on every continent. Amongst the praises of pulses are their vast geographical range, high nutritional value and low water requirements, their unique ability to self-fertilize, (adding necessary nitrogen to farmland and improving crops along the way), along with maintaining their health benefits over a long shelf life. All these reasons, make pulses an uncomprising enemy of hunger and malnutrition worldwide. Pulses are a genuine superfood for the future.

Air quality, access to clean drinking water and a healthy diet are three big challenges to humanity’s long-term survival. Dry pulses, combined with other staples, will be the key to meeting these challenges. As a category of foodstuff, pulses vary widely in nutritional properties and flavour, while as a whole, their unique qualities make them ideal for sustainable farming. Scientific research into plant biofortification, to increase the micronutrient content and improve resistance to disease and weather, have yielded excellent results with certain pulses. As we delve into this age-old food, we discover that pulses are primed to open up new pathways for agricultural and nutritional developments that, until recently, were pure science fiction.

And for good measure, from a cultural viewpoint, dry pulses are a symbol of travel, globalization and coming together. In ancient times, pulses kept the troops well fed, while in Italy, bags of pulses were served up to augur prosperity each new year. The domesticated pulse has been common to all peoples since olden times, with no distinction of race, religion or culture. If the need for food is something that unites every single human, the extraordinary global reach of pulses is a powerful universal language between nations. Pulses originating in Asia are found in Africa and vice versa, while the African varieties grow in the Americas, and American strains found their way over to Europe and Oceania. The widespread adoption of pulses has been diverse, yet constant and total, because they all have one thing in common: their unquestionable practical benefits which any nation or culture can appreciate.

When the time comes to cross the final frontier and humanity reaches for the stars, there is no doubt that pulses will travel with humans wherever they may go.
Pulses belong to the Fabaceae or Leguminosae family, these plants are the world’s third largest group of plant life. They are thought to have originated some 90 million years ago, with a diversification process beginning in the early Tertiary era. The Fabaceae family contains over 20,000 species and 700 genera, of which only some are categorised as leguminous plants, such as the Vicia, Cicer, Lens and Cajanus groups. Humans have cultivated pulses since the dawn of farming as one of the first plants in the world to be domesticated.

Dry pulses are the dehydrated edible seeds of these leguminous plants that produce from one to twelve grains of various sizes, shapes and colours within a pod. Their seeds can be used for human consumption or animal fodder. These hearty plants are not only healthy, they’re good for the earth as well. They can grow in arid lands requiring very little water – concentrated during their early stages of growth. Leguminous plants have nitrogen-fixation properties, a natural process that has been, and continues to be, important for soil enrichment. In short, unlike other plants, pulses carry properties that improve the soil in which they are grown and this helps other plants flourish as well.

Pulses, though small in size, pack quite a nutritional punch. Pulses are eaten all over the world in stews, flours, purées, accompaniments, snacks and desserts. They are a rich source of protein and essential amino acids that act as the perfect complement to cereals. They are also a good supply of carbohydrates and micronutrients, as well as high-quality dietary fibre. Their low fat content and the interaction of their sterols have been proven to be effective at maintaining low LDL cholesterol levels and reducing blood pressure.

And while some pulses are widely known, others are found only in certain regions or specific cuisines. Following is a classification guiding us through the most significant groups across the world of pulses.

What does FAO consider as pulses?

Though taxonomically it is correct to include fresh peas, green beans, soybeans, and alfalfa in this plant family, the FAO categorises these as vegetables. Likewise, seeds that are grown for biofuel, do not fall into the category of pulses as far as the FAO is concerned.
THE FOLLOWING LIST ILLUSTRATES THE MAJOR GROUPS

**DRI Y BEA NS**
- Borlotti beans
- Black beans
- Adzuki beans
- Cannellini beans
- Red kidney beans
- Haricot beans
- Flageolet beans
- Pinto beans
- Mung beans
- Urd beans (BLACK GRAM)
- Tepary beans

**L UPINES**

**BAMBARA BEANS**

**BROAD BEANS**
**DRY PEAS**
Dried green peas

**DRY PIGEON PEAS**

**VETCHES**

**DRIED COWPEAS**

**WINGED BEANS**

**SWORD BEANS**

**LENTILS**
Red lentils
Yellow lentils
Green or brown lentils
Puy lentils
Umbrian lentils

**CHICKPEAS**
Bambai chickpeas
Desi chickpeas
Kabuli chickpeas
Varieties of pulses

Dry Beans

These are pulses of the genera Phaseolus, from the Americas, and Vigna, found in various parts of Asia. They include: common beans—pinto, black, white or in various colours—all belonging to the Phaseolus vulgaris root and one of the planet's most widespread crops, lima beans, adzuki beans, black grams in various tones, mung beans, runner beans, ricebeans, moth bean and tepary beans. Dry beans are the most widespread of all pulses and can be found virtually in every country on earth.

The International Center of Tropical Agriculture in Colombia holds more than 36 000 samples of beans in its databases. The first domesticated beans in the Americas were found in Guitarrero Cave, in Peru, and dated back to around the Bronze Age. Evidence of pulse production around Ravi River in Punjab, the seat of the Indus Valley civilization, was found dating circa 3 300 BC. As a vine, the bean plant needs external support to grow, and native Americans were known to plant them alongside corn and squash, with the tall cornstalks acting as support for the beans. A staple food in the Middle East, South America, India and the Mediterranean, there is hardly a country in the world that does not have its own favourite bean dish today. But this was not always the case. In the past, people developed a love-hate relationship with beans. The upper classes in ancient Egypt shunned beans as they were considered food fit only for commoners. Ancient Romans used beans for balloting both in elections and in court. Black beans stood for opposition or guilt while white beans were cast in agreement or to declare innocence.

Adzuki Beans

Deep red with a sweet, nutty flavor, these beans are particularly popular in Asian cooking. The Japanese call the adzuki beans “the king of beans” and prize them for their reputedly health-giving properties to the liver and kidneys. In China, they form the base of a sweet paste used as a filling in a variety of breads and in mooncakes to celebrate the mid-Autumn festival. They can also be ground into flour as well as used whole in casseroles and warm salads.

Black Beans

Glossy black kidney-shaped beans are a favourite in Caribbean cuisine. They are surprisingly sweet and adding black beans to any dish adds a dramatic flair to soups, mixed bean salads or enchiladas.

Cannellini Beans

Also known as “Italian white kidney beans” or fasolia beans, these white beans are slightly small, kidney-shaped with a square end. When cooked, they have a fluffy texture and a slightly nutty, mild flavour. The cannellini bean is a popular feature of Italian cuisine, appearing in dishes such as minestrone, pasta e fagioli soup and as a stewed bean side dish made with garlic and rosemary.
Borlotti Beans
These rather large, plump oval-shaped beans are pinkish-brown in colour with reddish-brown streaks and a bittersweet flavour. When cooked, they are tender and moist, making them interchangeable with red kidney beans in most recipes such as vegetable stews, casseroles and salads.

Red Kidney Bean
Shiny, deep mahogany red kidney beans retain their colour and shape when cooked and have a soft mealy texture. A favourite in South American cooking, they are commonly used in *chili con carne*. They are also an integral part of northern Indian cuisine; where the beans are called *rajma* and are part of a dish of the same name. In southern Louisiana, USA, red kidney-beans are in the classic Creole dish of red beans paired with rice.

Flageolet Beans
Originating from France, the **flageolet bean** is a small, mint-green and kidney-shaped haricot bean. Picked before full maturity and dried in the shade to retain its green colour, this is the most expensive bean at market. The French treat this special flageolet bean simply: cooked until tender and then seasoned with herbs and a simple dressing to best enjoy its firm and creamy texture.

Haricot (or Navy) Beans
These beans go by different names: *navy bean*, *haricot* or *pearl haricot bean*, *white pea bean* or *pea bean*. These versatile, dry and ivory–coloured beans, small, with a slightly flattened oval shape, are smaller than many other types of white beans. The haricot beans are usually found in pies.
as well as in various soups. Unlike canned vegetables, which lose much of their nutritive value during the canning process, navy beans maintain their nutritive value even when canned.

**Mung Beans**
These small, oval, olive-coloured beans are mainly cultivated today in India, China, and Southeast Asia, but are widely eaten in their sprouted form, beansprouts. **Mung beans** are also cultivated in hot, dry regions of Southern Europe and the southern United States and used as an ingredient in both sweet and savoury dishes.

**Pinto Beans**
The pinto bean is a smaller and paler version of the borlotti bean. Speckled and in a variety of colours, it earned its name of “painted bean”. A staple in Mexican cuisine, it is most often eaten whole in broth or mashed and refried with garlic, chili and tomatoes and eaten with rice or as a filling for tortillas, topped with cream and guacamole.

**Tepary Beans**
This little-known bean is one of the oldest agricultural pulses of the American Southwest and Mexico. In Mexico alone there are over a hundred registered varieties of the tepary bean. Tepary can be toasted and then ground and mixed with water, but when cooked they are light and mealy.

**Urd Beans** *(Black Gram)*
These grey-black seeds are similar to mung beans in size and texture. The urd bean is widely eaten in Southeast Asia as a purée or **daal** and is known by many names, including urd, urd bean, urad, urid, black gram, black lentil or white lentil.
**BAMBARA GROUNDNUTS**

*Vigna subterranea* emerged in West Africa. These underground pulses grow exclusively in Africa (with a different name depending on the country) and they are very similar to peanuts, though their fat and protein content is lower. Their colour varies depending on the variety. **Bambara beans** are actually very hard seeds. Their seeds must be boiled for a long time before they can be used in stews. They are also eaten as a snack or to enrich certain flours or porridges. They are a very important food source in small African communities.

**LUPINES**

Including *Lupinus albus*, native to the Mediterranean, and *Lupinus mutabilis*, originating in South America, these are a popular snack usually preserved in brine or pickled. They are widely grown in Australia, Europe, Russia and South America and actually boast several species within each variety, each with a different level of bitterness or sweetness. They are also used as an additive to enrich cereal flours, as they can contain up to 40% protein.
Lupin, lupine or lupini beans were popular in ancient Rome and were cultivated throughout the Roman Empire. Today, the European white lupini beans are commonly sold pickled in brine and can be eaten with or without the skin.

DRY BROAD BEANS

Native to the Mediterranean and perhaps Central Asia, broad beans are undemanding, high-yield crops grown far and wide, including in Australia, Bolivia, China, Ecuador, Egypt, Ethiopia, Peru and Venezuela. Broad beans are also called fava beans, pigeon beans, horse beans, and Windsor beans. Broad beans have a long tradition of cultivation, being among the easiest of plants to grow in harsh, cold climates. With a strong, nutty flavor and tough, light brown outer skin and creamy texture, broad beans make an excellent accompaniment to a wide number of dishes.

Ancient Romans also cultivated broad beans and used them to celebrate the Roman feast of Fabária, as offerings to the gods.

DRIED CHICKPEAS

Cicer arietinum or chickpeas originated in the region now known as Turkey. Highly prized for their culinary versatility, nutritional value and storing potential, they are widespread around the globe. European colonisers brought them to the Americas and they are a plentiful staple in European, Arabic, Mexican, North American and western Asian cuisines. Also called garbanzo beans, robust and hearty chickpeas look like shelled hazelnuts and delight palates with their delicious nutty flavour and creamy texture. A favourite in Mediterranean and Middle Eastern cultures – falafel and hummus are two of the most popular chickpea dishes. In India, chickpeas are also ground into flour to make flat breads and fritters. Chickpeas are also used for split pea (daal) or for flour after the hulls are removed, particularly in India and Pakistan. There are three main types of chickpea:
Desi has small, darker seeds and a rough coat. Grown mainly in India, Ethiopia, Mexico and Iran. “Desi” means ‘country’ or ‘local’; its other names include Bengal gram or kala chana which means black chickpea or chola boot. Desi is probably the earliest variety because it closely resembles seeds found at archaeological sites. Domesticated chickpeas have a wild plant ancestor, Cicer reticulatum, which only grows in southeast Turkey, where the chickpea is believed to have originated. Desi is used to make chana daal, which is a split chickpea with the skin removed.

Bambai chickpeas are also dark but slightly larger than desi. They, too, are popular in the Indian subcontinent.

Green Chickpeas are a common sight in the bustling markets across the state of Maharashtra, India. Tender, immature green chickpeas are roasted over hot coals before the skin is removed. They are deliciously creamy as soups, in hummus, falafel, as a unique pesto or tossed into salads.

Kabuli is lightly-coloured, larger, and with a smoother coat and is mainly grown in the Mediterranean, South America, and in Southeast Asia. The name means “from Kabul”, and this variety was thought to come from Kabul, Afghanistan when it was introduced to India and then to Africa.

An uncommon black chickpea, ceci neri, larger and darker than the desi variety, is grown only in Apulia, in southeastern Italy.
LENTILS

*Lens culinaris* are thought to have originated in the Middle East. Coming in a wide variety of colours, from yellow to red-orange to green, brown and black, they originated in Asia and North Africa. The **lentil** is one of the oldest and hardiest foods. There is no legume more resistant to arid lands than the lentil. It needs very little water to grow and can survive the coldest of climates. Lentils do not need to be soaked before cooking and are ideal for thickening soups, casseroles and when cooked with spices, make for a delicious *daal*. Their tolerance of arid land and extreme temperatures, their multiple culinary uses and the way their flavour marries with almost any plant or animal ingredient, have led to their consumption all over the world. It is no wonder they have been a treasured foodstuff since the Egypt of the pharaohs. Archaeologists also discovered traces of lentils buried with the dead in Egyptian pyramids. The humble lentil had by this time already reached mythical status and was praised for its ability to enlighten the mind, even in the afterlife.

Yellow Lentils

Although less well-known than red lentils, bright yellow varieties are similar in taste and they are cooked in the same way.

Puy Lentils

These are small, dark blue-green bead-like lentils found in the Auverne region in central France. Considered to be the tastiest of all the varieties, they retain their shape during cooking.
their shape. They are ideal for casseroles, stuffings and when mixed with herbs can make a wonderful vegetarian pâté.

Umbrian Lentils
Italy and the Mediterranean diet in general has a long history of gorgeous lentils. These golden-brown Italian lentils are often cooked with onion, garlic and herbs. In some regions, they serve as a bed for spicy sausages or hamhocks or are served as soups or condiments. Italians and in the Philippines start off the new year by eating lentils just after midnight — according to tradition, the more lentils you eat, the more pennies you bring in — so serving up a huge dish of lentils is thought to bring wealth and good fortune throughout the whole year!

Red Lentils
Rich in both colour and taste, these deep-orange split lentils, also called Egyptian lentils or masoor daal, are the most familiar variety. Although lentils are quite hard even when fresh, unlike other pulses they do not require soaking prior to cooking. During cooking, they disintegrate into a wonderful thick puree. Ideal for thickening soups and casseroles, when spiced up, they make a delicious daal.

Green and Brown Lentils
Unlike the red and yellow varieties, these common disc-shaped lentils, known as continental lentils. Although they turn soft, they still retain
Varieties of pulses

DRIED PEAS
Of the genus *Pisum*, they are thought to have originated in the Mediterranean or Middle East. They were mentioned by Columella, one of the most important writers on agriculture in the Roman Empire. They are used for making soups and flours and in various eastern cultures they are enjoyed as a snack. The world’s leading producers of dry peas are northern countries like Canada, Russia and the Ukraine. Dry pea seeds were cultivated by hunter-gatherers and archaeological evidence suggests that these peas would have been planted in the eastern Mediterranean and Mesopotamia regions in the Neolithic Age.

Unlike lentils, peas are soft when young and require drying. Peas are tiny spherical seeds and are available either whole or split. Usually boiled or steamed, like split lentils, split peas disintegrate into a thick puree, making them perfect for *daals*, pureées, casseroles and soups. Peas have also played an important role in science. In the mid-19th century, Austrian monk, Gregor Mendel, through his keen observations of pea pods, developed the principles of Mendelian genetics, the foundation of modern genetics.

VETCH
*Vicia sativa* was consumed by humans as early as the Neolithic Era, and its cultivation was standardised and documented during the Roman Empire. It is now primarily grown as fertiliser or livestock fodder.

DRIED PIGEON PEAS
*Cajanus cajan*, are native to the Indian subcontinent, though their origin is sometimes disputed with Africa, where they are known as *Congo peas*. Colonial settlers introduced these plants to the Caribbean, and they are now a common feature of the region’s cuisine. Highly resistant to drought, their roots are ideal for enhancing soil. In addition to being a food source, in some eastern countries they...
are used to house insects for ink and resin production. But their greatest consumers are found in Asia. Today, they are mainly produced in India, Africa and Central America and are widely available everywhere. In India, pigeon peas are as important to the diet as chickpeas and are widely used to make daal or paired with cereals for a nutritionally complete meal.

**DRIED COWPEAS**

Of the species *Vigna unguiculata*, are pulses from West Africa that travelled relatively early on to Asia, sometime in the third millennium BC. They are grown and consumed all over Asia, Africa (especially Sahel, where the bulk of the world’s cowpeas are produced), Southern Europe, and Central and South America. Their cultivation needs and nutritional properties, combined with their ability to coexist with other crops in semiarid regions, make them an important part of the pulse family. Also known as the black-eyed pea, southern pea, crowder pea, lubia, niebe, coupe or frijole, the cowpea is an essential ingredient in Creole cuisine and Indian curries. The small cream-coloured bean bears a distinctive black dot on its side, where it was once attached to its life-giving pod.

**OTHER DRIED PULSES**

Less widely grown and consumed, these fall into various plant genera, such as the sweet hyacinth beans (*Lablab purpureus*) native to Africa, Brazil’s jack beans (*Canavalia ensiformis*), sword beans (*Canavalia gladiata*) from certain tropical regions in Asia and Africa, winged beans (*Psophocarpus tetragonolobus*) originating in New Guinea and velvet beans (*Mucuna pruriens*), of tropical origin. The grass pea, *Lathyrus sativus*, is known by various names. They are eaten in Asia, Eastern Africa and in European countries, such as Italy and Spain.
Part 2

Caring for & cooking your pulses
Caring for & cooking your pulses
Caring for & cooking your pulses

Keep in mind

- Water is the most important ingredient for pulses (also called legumes), and distilled or mineral water may be used when tap water is hard or contains excess chlorine or lime.

- The proportion of water to the legume should be enough to cover the legume and not too much that it cannot be absorbed. When legumes are not pre-soaked or they are more than 18 months old, two parts of water in weight or volume should be used to one part of legumes. If they were soaked in advance, one somewhat generous portion of water is sufficient to compensate for evaporation when they are cooked over medium heat. In any event, when cooking in an open pot you must always make sure that the liquid completely covers the legumes, and add water if needed; hot water if cooking chickpeas, and cold or lukewarm water for other pulses.

- If the legumes were not pre-soaked, they can still be softened by covering them with cold water and adding one-half teaspoon yeast for each half kilogram of legumes. After cooking over low heat for 40 minutes, drain and add cold water (less water if cooking chickpeas) to start the stewing process. Chickpeas are the only legume that should be cooked – after pre-soaking them for no less than eight hours – by placing them into hot or boiling water instead of placing them into cold water, which is what is done with other legumes.

- If they are cooked in a pressure cooker, this precaution should also be taken and they should be placed into the pot with hot water. Furthermore, to prevent them from breaking or losing their skins when they bump into each other during boiling, they should be placed in a strainer before putting them into the pot. Ingredients that are added to legumes may modify their overall nutritional value, and including appropriate ingredients in their preparation may greatly add to their taste and properties, whether it is fresh produce, meat or grains.

- At the end of cooking, if the broth is very liquid and needs to be thickened, the most effective thing to do is to puree it using a blender or by stirring it by hand, taking a couple of spoonfuls and mixing it with the stew, and sieving the pot later to bind the broth.

Storage

Most dry legumes can be stored for a long time, even for years, without spoiling and still retain their nutrients. As a general rule, pulses will retain excellent quality for 18 months. Although the longer they are stored, the more time-consuming and expensive it is to cook them. In any event, chefs prefer the freshest legumes when they are in season, which in the northern hemisphere begins in September, and in the southern hemisphere, around March.

To start with, your legumes will be found sold by the bulk at markets or pre-packaged from stores. Once home, they should be stored dry, preferably in airtight glass containers. When selecting, be sure to read labels and choose those that do not have added flavors.
The best seasoning for legumes is one that offers both olfactory and taste nuances that expand the diversity of stews. Don't be afraid to try out many aromatic and special herbs, such as cumin and other spices, that help digestion and are especially delicious.

One bay leaf is often added to cooked lentils, which gives them a delicious aroma and flavour. Another classic among seasonings is a mix or bouquet of aromatics, called a bouquet garni in professional cooking, comprised of thyme, parsley and bay leaf, ideal for stews and casseroles. Special seasonings such as whole pepper corns, cloves or curry, provide unusual savory flashes of taste, boldly fusing with vegetables, such as okra in Cajun cooking. Masalas or tahini offer yet another taste sensation to your pulses.

Paprika is an ingredient in dried pepper reduced to a powder by grinding. Its range in flavours may be sweet, smoky or spicy, which makes it an ingredient that expands the possibilities of nuanced flavours. Remember that paprika should be added to the sauté when the oil is already warm because cooking it on high heat makes the stew bitter. Garlic, onion and oil are used to refry items and should be added at the end of the cooking process.

and those with the lowest sodium content possible, in order to be able to season them to your own taste. In some cases, taste may be modified by the additives used during the preservation process. But keep in mind, these pulses still offer nutritional alternatives that reduce preparation times. Storage should be in a cool, dry place. If pulses are exposed to a somewhat warm environment, there is the same danger of food poisoning, as with any other seasoned food. Legumes that are stored in a hot and humid environment are more difficult to cook because they do not soften properly, and they run the risk of carrying bacteria. Pulses are usually stored in a glass jar or can or vacuum-packed or frozen are good for quick and easy preparation. Because they are usually prepared by boiling them, there is no risk of food poisoning provided that they are cooked and eaten immediately, or if refrigerated after cooking. Keep in mind that there is also the risk of fermentation, especially with soups stored in warm places. In tropical environments, legumes should always be stored in the refrigerator after they have been cooked and cooled.

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Caring for & cooking your pulses

Soaking

The first step in prepping legumes for cooking is to wash them, as they might contain impurities that should be eliminated, such as the remains of the hull or the chaff, dirt, small stones, or small seeds that will not soften during cooking. This is a precaution that is increasingly less necessary, because packaged legumes go through an effective pre-selection process. To wash them, place pulses in a larger strainer or colander and you should run your fingers through them to remove any foreign substances; Repeat the process again under a running faucet or water source. Once rinsed, place pulses in a large vessel for soaking. Be sure to use a large bowl because the legumes may increase in volume up to two to three times, depending on the variety.

Soaking should ideally not last more than 12 hours. After this time, the water should be changed. Soaking legumes for 24 hours will start the fermentation or sprouting processes. After soaking, rinse them until the water runs clear to eliminate the sugars that come loose during soaking, making pulses difficult to digest. Soaking should ideally not last more than 12 hours. After this time, the water should be changed. Soaking legumes for 24 hours will start the fermentation or sprouting processes. After soaking, rinse them until the water runs clear to eliminate the sugars that come loose during soaking, making pulses difficult to digest.

Cooking

In general, legumes are quite easy to cook. 1) Place them in a pot covering them with plenty of water and ingredients that add flavor. 2) Heat the water till boiling, and then 3) Cook on low heat until soft.

To stew legumes, place (prepped) pulses into your pot and bring to boil as above. They should be cooked over low heat with a little bit of olive oil and a vegetable such as onion, garlic, leeks or shallots, as seasoning. When soft, add them to a pot of chopped vegetables, or whatever recipe you are preparing. Boil everything together, taste for salt, and serve. If pre-cooked legumes are used, first rinse them, mix them directly in the pot with the seasonings and some water or broth, and bring to a low boil.

To serve pulses in salads, once they are tender, rinse them and let them cool. Prepare your salad, adding them perhaps on the top for a nice touch, making sure not to break them.

For beans or lentils, place them in a pot and cover with cold water or broth; do not salt them to keep them from hardening. To make them more tender, once the legumes have just started to boil, you can change the water for cold water, or you can shock it up to three times: adding a splash of cold water to decrease the boiling. When removing legumes,
especially beans, swirl the contents of the pot by picking up the pot by its handles rather than using a spoon, which will prevent the legumes from breaking. In truth, this only affects the aesthetics of the dish, but to many chefs, that is equally important! Salt to taste and serve.

Chickpeas are an exception to how legumes are usually cooked. As previously stated – but it bears repeating – start with warm water and a little salt, and if more water needs to be added, always add hot water. Adding in cold water – which is fine for other legumes – causes chickpeas to undergo a brusque temperature change that interrupts the cooking, causing them to harden thus preventing them from cooking uniformly.

Cooked legumes should not be left at room temperature for more than four hours. It is best to keep them above 55ºC so that they do not develop any type of bacteria, and they should be refrigerated or frozen as soon as possible after cooking. If they are going to be used in salads, add vinegar or lemon zest to keep bacteria from growing.

To lessen flatulence caused by legumes, the best remedy is to drain them after cooking, and then soak them again for one hour in cold water. Discard the water and then continue preparing your recipe.

Here we look at the basic necessities in order to prepare everyday pulse dishes. Simply put, to pre-prepare legumes, you will need: a strainer or colander to wash and rinse your legumes, an appropriate bowl in which to soak them, and a pot in which to cook them over low heat.

Pots, pans or casserole dishes should be made of stainless steel, or they should be enamel-coated. Wooden spoons or utensils should be used for stirring, because handling or simple contact with metal instruments during cooking can deteriorate, break or remove the skin off the legumes. Wide casserole dishes can be used in which the legumes just cover the bottom of the pan. This will allow them to cook uniformly, with the added advantage that the legumes resting on the bottom do not bear the weight of those on top.

A pressure cooker is very efficient, especially for shortening cooking times, although some expert chefs are hesitant to use them. Except for the risk of opening them too soon when there is still pressure inside – nearly impossible today with more modern pressure cookers – this type of cooking does not spoil legumes in any way. In fact, pressure cookers perfectly concentrate all the pulse qualities, more so than cooking them in an open pot. Pay close attention to each manufacturer’s instructions on cooking times and temperatures so that your legumes don’t turn into mush.
The power of pulses
1. Nutrition
Pulses are some of the most nutritious crops on the planet.

2. Health
They offer one of the best investments in your heart and overall health.

3. Climate Change
Their cultivation helps reduce greenhouse gases and provides increased carbon sequestration which is good for the planet.

4. Biodiversity
Pulses improve soil fertility and nourish crops planted alongside them.

5. Food Security
They are a low-cost crop for farmers, they flourish in arid lands and have a long shelf life.
Striking the right nutritional balance is a problem round the world

Either it is a question of taking in too much – with obesity an epidemic affecting 500+ million – or too little, with 800 million chronically hungry. Pulses provide the perfect solution. Beans, broad beans, chickpeas, lentils and peas are key ingredients of a healthy diet that can address both issues in each and every serving.

Pulses are naturally packed with low-fat protein and fibre. Rich in nutrients, vitamins and minerals, they are excellent antioxidants that counteract our natural ageing processes. Pulses contain twice the amount of protein found in whole grain cereals (wheat, oats and barley) and three times that of rice. Protein quality matters, particularly for growth and development. Some of the key minerals found in pulses include iron, potassium, magnesium and zinc. Pulses are also particularly abundant in B vitamins; including folate, thiamin and niacin.

Pulses are also high in complex carbohydrates and fibre, which means that they are slowly digested. Not only does this give a feeling of satiety, but it also helps stabilize blood sugar and insulin levels by reducing spikes after mealtimes. This makes pulses an ideal choice for people with diabetes, while improving insulin resistance makes pulses play a role in weight management.

Pulses and rice – a perfect match

While they may have higher protein-content than grains, pulses have an incomplete set of amino acids. In contrast, what pulses are missing can mostly be found in rice and other cereals. This is why rice and pulses, across cultures and continents, are often eaten together. Our ancestors must have intuitively known this, which might explain the wide variety of exotic pairings of beans, chickpeas or lentils, from South America to Asia and throughout the Mediterranean. Whether traditional delicacies or national dishes, pulses hold pride of place across the culinary spectrum, and undoubtedly, they will be served with grains.

While pulses are highly nutritious alone, to reap the full benefits from this bundle of healthy seeds one needs to increase the body’s ability to absorb their nutrients more fully. In many cultures, it comes naturally to combine pulses with foods rich in vitamin C. So you might find someone sprinkling lemon juice on lentil curry. This allows the body to absorb the iron found in pulses even better. The iron found in chickpeas, for example, is absorbed with difficulty unless combined with vitamin C. Being able to absorb as many of the nutrients available in pulses becomes particularly important for vegetarian and plant-based diets. All said, it takes very little to make pulses a potent food for preventing iron deficiency anaemia in women and children and contributing to overall good health.

Top 10 reasons to eat pulses

1. Low-fat
2. Low sodium
3. Good source of iron
4. High source of protein
5. Excellent source of fibre
6. Excellent source of folate
7. High source of potassium
8. Low glycemic index
9. Cholesterol-free
10. Gluten-free
### Nutritional Values

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<tr>
<th>Name</th>
<th>Scientific Name</th>
<th>Energy (kcal)</th>
<th>Energy (kJ)</th>
<th>Protein (g)</th>
<th>Fat (g)</th>
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*All pulses have 0 cholesterol*
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VALUES FOR 100G, DRY PRODUCT
If diet is one of the most important contributors to health, then a healthy diet is one of the best defences against illness. In fact, poor diet and malnutrition are the greatest causes of illness and premature death across the globe. Pulses are special forces from the plant world that not only can reinforce overall health, but actually prevent disease as well.

Pulses are rich in bioactive properties such as phytochemicals and antioxidants, which help in the prevention of disease such as breast and prostate cancer. Phytoestrogens are also known to prevent cognitive decline, reduce menopausal symptoms and promote bone health. In some studies, experts found that regular consumption of pulses – four or more times per week – helps reduce the risk of cardiovascular disease in subjects by 22 percent compared to those who consumed pulses less than once a week. This is due to a number of traits of pulses, in particular, their high doses of potassium and fibre. Potassium can aid in lowering blood pressure while fibre reduces LDL cholesterol. Super-rich in fibre, pulses contain both soluble and insoluble fibre. Soluble fibre is instrumental in lowering blood cholesterol levels and controlling blood sugar levels, while insoluble fibre aids in digestion and regularity.

Pulses also support nervous system health as they contain folate, also known as folic acid or vitamin B-9, which aids in energy metabolism and is needed for the synthesis of DNA, RNA and red blood cells. Without adequate folate levels, people are more likely to develop depression, heart disease and age-related vision or hearing loss. Folate also reduces the risk of
Scientists the world over conclude that our climate is changing rapidly, largely due to human activities releasing carbon dioxide and other greenhouse gases into the atmosphere. Agriculture production, namely farming, forestry, and livestock, emit nearly one third of the global total of CO₂. Agriculture is therefore both the largest culprit for climate change and its greatest victim. The answer to mitigating, adapting and reducing the effects of climate change come in the form of a single seed: the pulse.

Water is a precious commodity for poor farmers living on arid lands. Pulses require less water than other crops to grow, which means they are especially suited to dry, arid lands where the majority of these poor rural farmers reside. Some pulses, such as Bambara nuts, can grow in marginal areas where farmers are unable to cultivate other crops. Some pulses, like pigeon peas, are deep rooting, so they do not compete with other crops for water. Slow-growing in their early stages, they enable nearby crops to take root and flourish. In this way, pulses play their part in combating soil erosion and depletion. Pulses do not require nitrogen fertilizer as it fixes its own – basically, taking it from the atmosphere and carrying it into the soil. This self-sufficiency saves the environment from greenhouse gases, a by-product of the manufacture and use of nitrogen fertilizers.

Furthermore, pulses improve the soil’s carbon sequestration, meaning that part of natural CO₂ emissions are absorbed by the earth. Countries can favour cropping systems that are more resilient to climate change perhaps by cultivating hearty varieties known only in certain areas, such as Bambara beans, to great effect on our health and on our planet.

The conundrum facing policymakers and agricultural experts today is figuring out how to produce sufficient food for a growing population without further degrading natural resources and aggravating the effects of climate change. Agricultural policies cannot be developed in isolation but need to be harmonised and drafted in conjunction with social and economic policies. Farmers, pastoralists, fishermen and consumers need to be at the centre of policy discourse, so that together, we may eradicate hunger and improve livelihoods worldwide.
Not only does pulse cultivation mitigate the effects of climate change, but their unique attribute, namely their ability to biologically fix nitrogen, also has a direct and positive impact on soil biodiversity. When planted, soil microbes such as bacteria *Rhizobium* and *Bradyrhizobium*, are activated and boost soil fertility. *Rhizobium* infects the root hairs of the leguminous plants, thereby developing nodules to become small nitrogen factories perched on the roots of the pulses. Inside the nodules, *Rhizobium* sets to work, converting atmospheric nitrogen to nitrogen for healthy soil promoting plant growth. In short, pulses provide a home for the bacteria within the nodule and an energy supply in exchange for fixed nitrogen for the plant to grow in return, or rather, food and protein for the pulse to grow. Through this process, pulses can add from 30 to 40 kg of nitrogen into the soil per hectare. Some varieties of pulses are also able to free soil-bound phosphorous which also plays an important role in plant nutrition.

Activating soil bacteria to fix nitrogen signifies that the plant requires much less nitrogen fertilizer, if any. Producing their own fixed nitrogen in the soil, pulses contribute to higher yields in subsequent crop rotations, while at the same time boosting soil fertility, which in turn helps decrease the carbon footprint of future crops. Moreover, pulses grown as green manure (or cover crops) or as forage for livestock, can build up nitrogen even faster, fixing as much as 300 kg of nitrogen per hectare. Pulses also release hydrogen gas into the soil – up to 5 000 litres per ha/day – exerting yet another positive impact on soil biology.

Additionally, crop residues from pulses can be used as animal fodder to increase nitrogen concentration in the livestock diet, thereby improving animal health and growth. Even after harvesting, there are more benefits to be reaped. Plant residues left after pulse crops are harvested have a strikingly different biochemical composition to other crop residues, greatly contributing to soil biodiversity. For all these reasons, pulses are ideally suited to rural farmers but can be a model for agribusiness or organic farming everywhere.

Furthermore, pulses-as an important crop in agro-ecosystems help to maintain and increase vital microbial biomass and activity in the soil. In this way, pulses act as catalysts by nourishing the development of those organisms primarily responsible for promoting soil structure and nutrient availability. High soil biodiversity provides ecosystems not only with greater resistance and resilience against disturbance and stress, but also with the ability of ecosystems to suppress diseases. Each of these features favouring the mainstreaming of soil health, naturally comprises the very foundation of food security, thus promoting both individual and planetary health.

On their own, pulses are not, however, a panacea for on-farm diversity. If a farmer switches from cultivating cereal or grains only, to cultivating only pulse species, on-farm diversity is not enhanced. Ideally, pulse crops can benefit the entire system when planted as a crucial component of multiple cropping systems; namely intercropping, crop rotation and agroforestry. These cropping systems favour a higher species diversity than monocrop systems. By increasing species diversity of cropping systems, one sees a more efficient use of resources, namely light, water and nutrients, as well as higher outputs as yields are increased, and overall crop failure is diminished. Choosing which multiple cropping system to use is ultimately determined by the individual attributes of each agro-ecosystem. What is clear is that pulses should be an integral part of any agro-ecosystem due to the immense positive effects they have on the ecosystem.
In many countries, meat, dairy and fish are expensive and far beyond the reach of the local populace. It is therefore not surprising to find that these groups depend on cheaper plant foods for their protein needs. Pulses represent an affordable source of protein and minerals and when combined with rice, cereals or pasta, can make all the difference in staving off malnutrition and in promoting good health.

For most populations in developing countries, pulses constitute the major source of protein, where meat is unavailable or too expensive.

Waste not, want not
Incredibly, food waste is another side of the same coin, particularly when addressing food security globally. Losses and wastage occur throughout the entire agricultural supply chain, and in nations both rich and poor. Experts estimate that as much as one-third of the food produced for human consumption worldwide is lost or wasted. But bring the multi-tasking pulses into the picture, and the travesty of food waste simply is no more. Pulses are shelf stable, meaning that once stored in airtight containers, they can last months, years even, without losing their nutritional value. Therefore, the proportion of food waste or spoilage of pulses prior to meal preparation is very low. This feature alone can be enough to see rural farming communities through unexpected calamities such as droughts or floods that typically wipe out months of hard labour and ruin crops.

Today, 90% of the world’s pulses come from 100 million farmers who cultivate them on arid lands. Seeing that pulses require less water than other crops, they can be cultivated in climes with limited or often erratic rainfall; lands where other crops can fail or produce low yields. Some pulses, such as Bambara nuts, are able to grow in marginal areas where farmers are unable to cultivate other crops. Pulses are also cheaper to grow as they do not need nitrogen fertilizers. Common to many of these farmers is that they are subsistence farmers, meaning that pulses are usually grown to be eaten by the farmer, with only a small part destined for sale at market. When pulses are grown alongside other crops or in rotation, farmers typically enjoy higher yields of pulses and other crops. By so doing, farmers also reduce their vulnerability to crop failure. Beans, for example, can command up to four times the price of wheat at markets, giving the farmer some additional food security.

Today, there is an alarming trend in developing countries that could put all these advantages asunder. As incomes increase, pulses are discarded in favour of meats seeing that pulses are considered a ‘poor man’s protein’ in some cultures. This shift in consumer preferences is giving rise to a host of global concerns, not least environmental. Given all that we know about the power of the pulse, it’s in everyone’s best interest to keep them in our lives and on the menu.
Part 4
How are pulses grown?
Observing first-hand how vegetables grow in your very own garden patch can be both fun and instructive. Once you have harvested them from the vines, you will be able to experience the richness of ancient flavours in modern times.

But first, a caveat: home-grown pulses will not work for city dwellers, or at least those with only a terrace. This is because the pots or planters have a very limited depth of soil, preventing the full development of the roots necessary to grow legumes properly.

So, you must start off with a small garden patch. When organising it, go for at least 5x2 meters, to mimic the very experience and sensations lived out by a subsistence farmer of pulses. In your tiny patch of our planet, you will be paying a tribute to the most generous and competent plants for human consumption. You will nurture an appreciation for its exceptional quality to thrive without requiring great care. And once you have reaped its bounty, you will be able to store your seeds for more than a year, living off its nutrition long after the seeds have come to light.

Bean seeds or beans themselves come in many different shapes and colours. The same is true for lentils and chickpeas. They are available in many varieties and can be found in organic stores or seed stores for farming, or at herbalist shops. Starting with our three reference pulses (Beans, Lentils, Chickpeas), you would need about 50 g of each for your garden to generate quite satisfactory crops.

Legumes are not picky about the quality of the earth as they can grow in dry conditions, although they prefer moderate wetlands preferably with a silt-clay component. It is important to make sure the soil does not contain gypsum because it detracts from the quality of the crop. So, making sure that your garden offers a sunny spot on porous, damp soil that gets well-drained and is protected from the wind, and you are ready to plant your seeds.

Planting should take place at the beginning of the warm season (around May in the northern hemisphere or November in the southern hemisphere). First, prepare the soil by covering it with compost (fresh or dried crushed leaves, wood ash, slightly decomposed fruit scraps, leftover food, but no meats, detritus and never with chemical fertilizers or manure). Next, carve three long furrows lengthwise across the garden, leaving a distance of about 40 cm between each furrow.

Take your seedlings, making sure they are well-watered (for about one hour) prior to planting. You will use one type for each furrow dug out. Make tiny holes in which to bury the seeds – these should be about three cm deep and about 20 cm apart. Plant the seedlings in each of these holes, one furrow for each type: Chickpeas, Lentils, Beans.

Because pulses naturally can take nitrogen out of the air and fix it into the earth unlike other plants, they are quite self-sufficient in terms of providing for their own natural fertilization. They can live off the richness of the organic matter from the compost, and require no additional fertilizers nor special care. Simply water them twice a week in very hot weather or when the soil is very dry, making sure to weed around the plant if you find weeds sprouting.

After about two weeks, the pulses will start to sprout. After one month, their shoots will open as well. At this point, it is recommended to plant a stake about 1 metre tall next to each pulse shoot. The chickpeas and lentils will begin to grow up upon it. Use a higher trellis for the beans to climb upon.

If you find that a plant is not growing well, it may be for a number of reasons: it was planted too deep, or the seed was dehydrated because the soil was too compact or the garden patch was over-watered.

Pulses take three months to develop fully. Beans, chickpeas and lentils are harvested just as their pods start to open. This, or once you see the
yellowing of their leaves, means it is the right time to harvest.

Cut the plants at the base of the stalk. Spread them out in the sun and leave to dry. The pods are ready for threshing. This is done by winnowing (or prying open) the dry pods, separating out the tiny grains of lentils, chickpeas and beans. Leave the seeds in a well-ventilated and dry place for a few days making sure the humidity does not exceed 15 percent.

Once fully dried, your pulses are ready to be eaten or stored in airtight containers. You can use your pulses in soups, stews, and many more tasty dishes – a rich reward for your work! Out of the 20 seedlings planted in each furrow, you should expect a yield of about one and a half kilos of dried pulses. This is an excellent output.

By planting and producing your very own pulse garden patch, you pay homage to our ancestors who domesticated these ancient varieties and who left us pulses for posterity – so many centuries later – to still be enjoyed today.
Hundreds of plant species, hundreds of varieties and places to grow them, advancing any generalizations about pulse cultivation can prove to be quite problematic. The Fabaceae family has an extraordinary ability to adapt to different climates and terrain. It is found growing equally in mountain ranges and coastal towns; from the tropics and into the desert. Given the remarkable geographical range of these wonder plants, it is hard to find literally a common ground. But what we do know, is they all bring a terrific source of nutritional value to the table. Beans of the genus Phaseolus, for example, emerged in Central America due to a highly favourable terrain and climate.

Their cultivation was further improved upon later, when they were grown in the humid climes of South America. For their part, chickpeas and lentils originated in regions with more extreme temperatures and less fertile soils, like the Middle East. Similarly, some African and Asian wetlands favoured the appearance and development of other bean varieties of the genus Vigna, like cowpeas, while in more hostile regions, underground pulses like the groundnut emerged.

The domestication of these plants also occurred heterogeneously, producing a wide variety of scenarios all across the globe. In Central America, we know that bean growing came into...
being very early on in sidestep with maize cultivation. The pulse's ancient climbing plant found that cereal stems made for ideal stakes, and the two crops entered into a genuine symbiosis. As previously noted, in fact, pulses are highly beneficial to the earth used for maize cultivation. Later on, with the arrival of mechanised agriculture, it became convenient to develop low bean plants, rather than climbers. In the less fertile regions of Africa and Asia, however, certain pulses were introduced as rotation crops, with some land only becoming productive after leguminous crops were grown there. With pulses grown side by side with other crops, farmers were able to extend their productivity and product offering.

Aside from the obvious nutritional benefits that vast civilisations have obtained by combining pulse and cereal crops in one way or another, one of the great virtues from an agricultural point of view of most of the plants in the Fabaceae family, is their natural nitrogen-fixation properties. They take from the atmosphere and put it directly in the ground - creating a unique synergy for fertilisation and growth. This process occurs thanks to the relationship between the roots and rhizobia, a kind of symbiotic bacterium. Add to this the rich phosphorous that leguminous plants contribute to enrich the soil. These surprising self-sufficient “abilities” of pulses mean that zero or minimal chemical additives are needed to grow them; translating

3

**Good news for poor farmers**

Growing pulses can mean a variety of benefits for poor farmers. Pulses grown with other crops or in rotation will fertilize the soil, and can increase yields on less productive farmlands. Some pulses, such as beans, fetch more at the market than some cereals giving poor farmers a better chance at ending the poverty cycle.

4

**Help crops to grow**

Pulses’ nitrogen fixing qualities mean that crops planted alongside pulses reap the benefits and grow faster. Pulses are also deep rooting, which means they do not compete with other crops for water. This makes them ideal companions.

5

**Cost less to grow**

Plants need nitrogen fertilizers to grow. Pulses can fix their own nitrogen in the soil, which means they nourish the soil instead of depleting it. This means farmers don’t have to buy nitrogen fertilizers, which in poor areas is a substantial cost savings for the farmer.
Cultivation around the world

### ‘Clean’ crops: do not emit greenhouse gases

In stark contrast to animal products, pulses have been shown to emit hardly any greenhouse gases (lentils emit 0.9%). Cultivating and eating more pulses would bring huge benefits to the environment.

### Help fertilize soil

While other crops deplete the terrain in which they grow, pulses actually do the opposite. Grown as green manure or cover crops or as forage for livestock, pulses can build up nitrogen in the soil even faster; fixing as much as 300 kg of nitrogen per hectare. Pulses also release hydrogen gas into the soil – up to 5,000 litres per hectare per day, exerting yet another positive impact on soil biology.

### INTO dietary, economic and environmental benefits.

Pulses’ low water consumption is also significant. On average, pulses require twenty times less water than any source of animal protein, and generally far less than other crops. This is because their plants capture moisture from surface sources. These extraordinary biological characteristics were observed in agricultural research over a hundred years ago, but there is no doubt that, on an intuitive level, farmers have been aware of them for thousands of years, since the dawn of the agricultural revolution itself.

In more recent times, economic factors have changed the pulse map globally. In Canada, for instance, an unexpected rise in wheat prices was the catalyst of a surge in pulse production. This led to a rational diversification of agricultural risk; adopting an important rotation farming model based on the trinity of wheat, barley and pulses. This not only stabilised the situation, but also improved soils and fostered a more competitive and sustainable trade in the process.

The fact that global fluctuations in cereal prices, which vary more drastically from season to season, and that pulse prices tend to remain more stable over time; have led many regions to adopt agricultural programmes favouring pulses, as far as their capabilities would allow. Australia, Brazil, Spain, India and Nigeria, to name just a few notable examples from each continent, now have powerful pulse-growing industries that deliver considerable dietary, economic and social benefits both domestically and through foreign trade.
Furthermore, these plants boast an agricultural efficiency – offering a tremendous source of extremely high-quality plant protein, far superior to that of raising livestock, which in many cases is itself dependent on pulses for animal fodder. Regardless of the value of animal protein in the human diet, it is indisputable that livestock farming inherently has a higher energy cost than crop cultivation. Seen objectively, pulses, therefore, offer one of the best cost-benefit ratios of any food on the planet.

As a crop, clearly pulses provide tremendous benefits. Although the benefits may vary from place to place and pulse to pulse, their growth is important to humankind.

Once harvested, people continue to reap the benefits of the pulse. Their quality does not deteriorate after being dried and with proper storage their nutritional properties are maintained for a very long time. This probably makes them the most durable product for the larder without freezing, above even many canned goods. And at the same time, with the exception of some regional varieties produced only in small quantities, they are highly affordable.

With humanity facing the challenge of meeting the complex nutritional needs of a burgeoning population living in a paradoxical world in which hundreds of millions of obese coexist with an even greater number suffering chronic hunger, pulses may be the answer. Thanks to their versatility, adaptability, high yield and extraordinary nutritional properties, pulses provide a highly effective solution. Dried pulses mean a vital means of feeding the world for a more vibrant future for all.

Pulses

Zero Waste

Every part of the pulse can be used. The pods can feed people, the shoots used for animal feed, or the pulse can be left in the earth to provide nourishment for the ‘soil.’

Need less water
to grow

70% of the world’s accessible fresh water is used for agriculture. 27% of the world’s water footprint comes from the consumption of animal products. Pulses need 20 times less water than animal products to grow. In industrialised countries, moving towards a vegetarian diet can reduce our food-related water footprint by a full 36%.
Pulses in the World

1 PRODUCTION SHARE BY REGION

Dry bean is the most prominent pulse found in diets around the world. It provides protein, complex carbohydrates, and valuable micronutrients for more than 4% of the global population. In many parts of the world, the bean is the second most important source of calories after maize. A vast number of people in sub-Saharan Africa depend on the crop as a primary staple, which is cultivated largely by women.

Chickpea is a highly nutritious grain legume crop and is one of the cheapest sources of protein. Most production of chickpeas (95%) takes place in developing countries with 84.3% from Asia. As of 2010, chickpeas were grown on about 12 million hectares which represents an increase in output over the past 30 years from 4.8 million tonnes to 11.1 million metric tons. South Asia cultivation accounts for more than 71% of the world chickpea by area. India is the largest producer of chickpeas accounting for 67% of global production in 2013. This is 10 times the amount of the second largest producer, Australia. Over the period 1978–1980 to 2008–2010, India increased its land area dedicated to chickpeas marginally from 7.6 million hectares to 7.9 million hectares, while production increased by a full 40% (from 4.8 to 6.8 million tonnes). Other important chickpea producing countries are Pakistan, Turkey, Mexico, Canada and Australia.
**Pulses in the World**

**PRODUCTION SHARE BY REGION**

**WORLD PRODUCTION OF MAJOR PULSES**

Average 1993 – 2013 (Thousand tonnes)

<table>
<thead>
<tr>
<th>Region</th>
<th>PEA</th>
<th>LENTIL</th>
<th>CHICKPEA</th>
<th>BEAN</th>
<th>FABA BEAN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>5 323</td>
<td>45</td>
<td>156</td>
<td>503</td>
<td>589</td>
<td>6 616</td>
</tr>
<tr>
<td>Africa</td>
<td>390</td>
<td>103</td>
<td>391</td>
<td>3 470</td>
<td>1 137</td>
<td>5 491</td>
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<tr>
<td>Asia</td>
<td>2 050</td>
<td>2 076</td>
<td>7 889</td>
<td>8 762</td>
<td>1 892</td>
<td>22 669</td>
</tr>
<tr>
<td>Americas</td>
<td>4 669</td>
<td>1 079</td>
<td>371</td>
<td>6 870</td>
<td>168</td>
<td>13 157</td>
</tr>
<tr>
<td>Oceania</td>
<td>340</td>
<td>135</td>
<td>309</td>
<td>46</td>
<td>218</td>
<td>1 048</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>12 772</td>
<td>3 438</td>
<td>9 116</td>
<td>19 651</td>
<td>4 004</td>
<td>48 981</td>
</tr>
</tbody>
</table>

**Pea** is grown commercially in almost 100 countries with production concentrated in Canada, Russia and China. Jointly, these three countries produce over one-half of the world’s dry peas. Canadian dried pea production increased considerably over the past 30 years, expanding from less than 1.57 million tonnes per year in the early 1980s to approximately 3 million tonnes in 2012, or 12 percent per year. World dried pea production peaked in 1990 at 16.6 million tonnes. Since 1990, global dry pea production declined at an average annual percentage rate of 1.8% and, in 2012, was approximately 9.9 million tons.

**Chickpea** is a highly nutritious grain legume crop and is one of the cheapest sources of protein. Most production of chickpeas (95%) takes place in developing countries with 84.3% from Asia. As of 2010, chickpeas were grown on about 12 million hectares which represents an increase in output over the past 30 years from 4.8 million tonnes to 11.1 million metric tons. South Asia cultivation accounts for more than 71% of the world chickpea by area. India is the largest producer of chickpeas accounting for 67% of global production in 2013. This is 10 times the amount of the second largest producer, Australia. Over the period 1978–1980 to 2008–2010, India increased its land area dedicated to chickpeas marginally from 7.6 million hectares to 7.9 million hectares, while production increased by a full 40% (from 4.8 to 6.8 million tonnes).

**Faba or fava bean**, also called broad bean, field bean, horse bean and bell bean, is an erect leafy winter or summer annual. Faba bean is used as human food in developing countries, and as animal feed (mainly for pigs, horses, poultry and pigeons). Faba bean is grown on 2.5 million ha of land globally, with Central and East Asia contributing 39% and Sub-Saharan Africa about 21% of the total area under faba bean cultivation.

**Lentil** is relatively tolerant to areas subject to drought and is grown throughout the world. The crop has great significance in cereal-based cropping systems because of its nitrogen-fixing ability, its high protein seeds for human consumption and its straw for animal feed. Protein content ranges from 22 to 35%, and like other grain legumes its amino acid profile is complementary to that of cereals. World production has increased by almost 92% in the past 20 years.
Major Producers

The world has seen an increase of 31% in production during the years 1990 to 2014. In 2014, total production of pulses was 77.6 million tons.

**Canada**
- Canadian production of the major pulses (dry peas, lentils, beans and chickpeas) increased from about 586.6 thousand tonnes in the early 1990s to 5.8 million tonnes in 2014, more than a tenfold increase in 25 years.

**USA**
- 55% of US pulses are dry beans.

**Brazil**
- 98% of production is of different varieties of dry beans.

**USA**
- 55% of US pulses are dry beans.

**China**
- Produces 50% of world production in 2013.

**Ethiopia**
- Ethiopia is the world’s top producer of vetches.

**Australia**
- 2 million hectares are planted annually to pulse crops across the country, which are the third largest crop grown after wheat and barley. Pulses represent 8% of the total crops area harvested (wheat is 56% and barley 20%).

**Nigeria**
- Nigeria is the top producer of dry cowpeas.

**Russia**
- The Russian Federation accounted for 36% of the world’s production in 2005.

**Turkey**
- In 2014, Turkey was the fourth global producer of lentils and sixth worldwide producer of chickpeas.

**Brazil**
- 98% of production is of different varieties of dry beans.

**Canada**
- Canadian production of the major pulses (dry peas, lentils, beans and chickpeas) increased from about 586.6 thousand tonnes in the early 1990s to 5.8 million tonnes in 2014, more than a tenfold increase in 25 years.

Today research investment to develop better strains of seeds of pulses hovers at $175 million, paling in comparison with the billions of dollars invested in other crops such as maize.

In 1961, 64 million hectares grew pulses. This figure has increased to almost 86 million hectares in 2014.

**Major Producers of Pulses**

India 20
Canada 5.8
Myanmar 4.9
China 4.5
Brazil 3.3
Australia 3.0
Ethiopia 2.6
USA 2.4
Russia 2.3
Nigeria 2.2
India: World leader in production with 20 million tonnes of pulses in 2014. Pulses are one of the most important sources of protein, especially for a large part of the population who are vegetarian.

Canada: Canadian production of the major pulses (dry peas, lentils, beans and chickpeas) increased from about 586.6 thousand tonnes in the early 1990s to 5.8 million tonnes in 2014; more than a tenfold increase in 25 years.

USA: 55% of US pulses are dry beans.

Nigeria: Nigeria is the top producer of dry cowpeas.

Russia: The Russian Federation accounted for 36% of the world's production in 2005.

Turkey: In 2014, Turkey was the fourth global producer of lentils and sixth worldwide producer of chickpeas.

China: China produces 37% of global production of broad beans.

Ethiopia: Ethiopia is the world's top producer of vetches.

Australia: 2 million hectares are planted annually to pulse crops across the country, which are the third largest crop grown after wheat and barley. Pulses represent 8% of the total crops area harvested (wheat is 56% and barley 20%).

Myanmar: Myanmar is the third global producer of pulses. Pulses is the second most important crop grown in the country, after rice. The country doubled its production of pulses in the last 10 years to 5 million tonnes in 2014. 63% of its production is dry beans used for domestic consumption.

Today research investment to develop better strains of seeds of pulses hovers at $175 million, paling in comparison with the billions of dollars invested in other crops such as maize.
Major Exporters and Importers

International trade in pulses has increased steadily by 5.5% each year since 1961.

6 TOP TEN TRADERS IN PULSES

2013

1/ India 3 800 859
2/ China 1 106 176
3/ Bangladesh 816 850
4/ Pakistan 433 998
5/ Egypt 433 395
6/ United Arab Emirates 391 069
7/ Brazil 373 729
8/ USA 360 838
9/ Turkey 335 896
10/ Italy 296 039

Reported imports and reported exports between countries do not always match for a number of reasons: as an example, the time-lag factor of an export leaving a country in December and entering another as an import in January of the following year.
Major Exporters and Importers

1. India
2. China
3. Bangladesh
4. Pakistan
5. Egypt
6. United Arab Emirates
7. Brazil
8. USA
9. Turkey
10. Italy

International trade in pulses has increased steadily by 5.5% each year since 1961.

Reported imports and reported exports between countries do not always match for a number of reasons: as an example, the time-lag factor of an export leaving a country in December and entering another as an import in January of the following year.
A World of Pulses
01 NORTH AMERICA

01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2010 - 2014)
Dried peas, lentils and beans are the top pulses produced in the region.

02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE
In these years, the production of pulses has doubled.
Although North America is home to two developed countries where meat and fish protein are preferred by consumers, these are also countries with exceptional farming models. The culture of pulses in Canada and the United States is closely linked to their extraordinary production processes and export trade. Canada alone exports lentils, beans and chickpeas to 150 markets worldwide, with the main producing regions being Alberta, Manitoba, Quebec and, above all, Saskatchewan. Much of this is largely in part to the important role of tinned pulses, especially baked beans. Baked beans are a culinary feat not only in terms of how they are preserved, but also for how well they can travel. They have even achieved cultural icon status through cinema, television, literature and in many art forms. Just think of Andy Warhol’s Black Bean.

We should also keep in mind that these are two countries with powerful multicultural societies. And this cultural plurality is naturally reflected in the food found in great
North American cities. Canada, for example, has seen significant immigration from countries that consume a high proportion of pulses, such as India, the birthplace of 12% of foreign residents in Canada. Meanwhile, cities like Toronto are home to 90 different nationalities. It is not surprising, then, that the world’s second largest country provides a warm hearth for food from India, Iran, Turkey, Portugal, Brazil, France, Mexico, Spain and Italy, and all the flavours they bring with them from spicy *tarka daal*, to hearty *feijoãda*... To this mix we need to add Cajun specialities from Acadia (the old colony of New France), also found in the southern United States. Their unique cuisine is based around pulses, rice, seafood and the “holy trinity of vegetables”, namely celery, onion and peppers.

For its part, the United States offers an immense cultural variety of foods across its territory, due to the complex history of its formation and subsequent waves of immigrants throughout each state and region. Although it comes as no surprise that major cities like Chicago, Los Angeles and New York are home to a wide range of ethnic cuisines, it is important to note that dried pulses consumption varies widely from place to place. Migration has clearly played an important role, which explains why bean soups in Idaho have origins with Basque immigrants. Influence from the Canary Islands shows up...
in pulse stews in Louisiana, a state known for its veritable creole gastronomy with New Orleans at its heart and strongly influenced by France, Spain and Latin America.

The south’s soul food is equally important in the gastronomy firmament, using a host of dried peas. Bean soups from Appalachia and traditional Midwest and northeastern dishes feature dried pulses once vital to old mining communities for their shelf life have left their mark in recipes today. And of course, honourable mention must go out to Native Americans and their time-old tradition of beans. They were the original inhabitants of the Eastern Woodlands, the Great Plains and the regions of the Gulf of Mexico. With them, southerners who were most influenced by Central America and the Caribbean. Cornbread is common to both as well as succotash, made from a mixture of maize and beans.

Of course, the influx and influence of Latinos in the United States cannot be ignored – and not because of the remarkable success of restaurant chains based on Latin American cuisine. Around 13% of the US population is Latino, spread across the entire country, from California to Florida and from Houston to New York. For the most part, they are of Mexican origin, but there are also Cubans, Puerto Ricans and, to a lesser extent, groups from Central and South America. But common to all of their gastronomic traditions are dried pulses, especially beans (known as frijoles). It goes without saying that the progressive growth in the Latino population has brought about a gradual change in domestic eating habits in North America. Pulses will continue to take centre stage, thanks also to recent recommendations regarding a healthy diet – animal proteins are getting replaced by foods rich in vegetable proteins, and that means pulses.

During the Great Depression, in the USA beans were called “poor man’s meat” and they saved many lives thanks to their nutritional value and low price.

In all likelihood, the first gastronomic scene in the history of cinema belongs to the film The Immigrant from 1917 (also called Broke). Starring Charlie Chaplin and Edna Purviance, it features a pulse as its leitmotiv. In the famous scene, both actors enthusiastically eat beans in a restaurant. Although according to accounts, there were so many takes until the scene was wrapped, that the actress actually fell physically ill.

The Cloud Gate public sculpture on the AT&T Plaza in Millennium Park in Chicago (Illinois), was designed by the Indian-born British artist, Anish Kapoor and is known, for obvious reasons, as The Bean.

In North America, there is a significant production of hummus, the chickpea-based dish, with the product often sold together with sauces such as Argentine chimichurri or horseradish; innovations that stray far from the origins of the dish.

The port of Vancouver is one of the main worldwide distribution centres of dried pulses.

Tex-Mex food is one of the most clearly documented culinary fusions in the whole of the continent, and chili con carne came one of its most famous dishes. By 1907, it was already inextricably linked to red kidney beans, as witnessed in Janet McKenzie’s The Boston Cooking School Magazine of Culinary Science and Domestic Economics.
03

**PEAS. VALUE OF PRODUCTION**
Fluctuated while rising from 1990 onwards, it dipped in 2011, recovered and rose to new heights in 2013.

1990-2013
Average value
**288.91 Million USD**

04

**PRODUCTION OF PEAS**
Production has increased exponentially over the years.

2010-2014
**3 830 THOUSAND TONNES**

05

**QUANTITY OF IMPORTS PER TYPE OF PULSE**
North America imports a modest quantity of pulses every year.

06

**QUANTITY OF EXPORTS PER TYPE OF PULSE**
Its three top crops, dried peas, lentils and beans, are mainly exported.

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
BOULDER, COLORADO (USA)
A portrait of chef Ron Pickarski.
Ronald A. Pickarski has become a rising star for vegetarian chefs specialising in pulses. He combines them with spices and wheat flour, creating a vegetarian meat substitute, turning this into prime veggie burgers, whose taste and texture feels like meat in the mouth. He works his magic turning black beans, quinoa and sun-dried tomatoes into a delicious and healthy bread. Pickarski is deeply interested in the proteins present in pulses, since these are the most important molecules in terms of an organism’s structure. They even regulate body mass and he wants to make sure that pulses are an integral part of our diet in the future. He uses statistics sensitively and consistently, citing the figure that by 2054 the global population will need approximately one billion tonnes of protein, and alternative sources such as pulses can provide one third of this amount.
But Pickarski was not always in the culinary limelight. He cut his teeth (literally) between 1968 and 1993, as a monk in the Franciscan Order of Friars Minor in Oak Brook (Illinois). He worked in the kitchens and began to develop specially-designed diets using the organic food grown on site, before moving on to preach cookery and become a nutritional consultant. His religious affiliation is rather unusual in chefs, but it is a source of great pride for Pickarski, and in all likelihood is at the root of the humility and honesty he shows in all of his work with food.

Currently living in Boulder (Colorado), Ron is the Executive Chef of Eco-Cuisine Inc., the company he founded in 1993. They provide consultancy services to promote healthy eating, research natural foods, develop products based on plant proteins and hold gourmet vegetarian cooking classes. He holds Certified Executive Chef status from the American Culinary Federation, and in 1994 he also founded American Natural Foods in Boston (Massachusetts), a non-profit organisation whose mission is to inform businesses and the public about vegetarianism and promote plant-based products, key amongst which are pulses.

“Pulses,” says Pickarski, “are an ancient foodstuff and perfect for human consumption. They are an important source of protein, they are bursting with complex carbohydrates and fibre, and what’s more they’re low in fat. Only soya has a high fat content. I believe that pulses should become a main course for everybody, and my
philosophy regarding pulses is that they should be seen more and more as a substitute for meat.”

He has dedicated forty years of his life to developing a cuisine based on plant products, collecting tips for healthy eating and taking part in the International Culinary Olympics. His mission is to raise vegetarian cooking in general, and very specifically cooking with pulses, to the level of classic gourmet cuisine. It is clear to Pickarski that although the United States both produces and consumes a lot of pulses, they are still not generally well-perceived in culinary circles. Although most people would agree that a vegetarian diet is healthy, they do not consider pulses to be more important than fresh vegetables. Nevertheless, there are dishes
that have helped pulses to be accepted by the more reluctant: trailblazers such as Boston baked beans, Cajun gumbo with *alubia criollo* beans in Louisiana or pinto bean *burritos* in the southeast. Appearing more often on menus, they suggest that not only are there traditional recipes with pulses in North America, but new and exciting dishes, too.

Pickarski’s incredible output has included designing, opening and promoting many innovative restaurants in Florida, Massachusetts, Illinois, Kansas, Wisconsin and Colorado, showcasing vegetarian and vegan food, a macrobiotic diet and even pulses themselves. He has also sung the praises of pulses in books, videos, and on TV, featuring them on *Home on ABC*.

Recently, Pickarski published *The Classical Vegetarian Cookbook,* a modern compendium of responsible and ethical food. Alfonso Contrisciani, perhaps the North American chef who most actively supports sustainability, calls it a “Valuable and necessary tool for all who want to fully understand this new 21st century cuisine – animal-free with classical standards and classical taste.” In its some 400 recipes, the book explores vegetarianism, making a sound case for a vegetarian diet, tackling head-on the problem of protein sources. In it, one is inspired to create pulse dishes to satisfy modern tastes while guaranteeing a more sustainable future for our food.

**Cannellini Bean Polenta Loaf**

**Cannellini Bean Polenta makes a complete protein with the bean-grain combination. It is an entree that needs only a sauce and vegetable to serve as a whole meal.**

1. Place the oil in a 3-quart saucepan; add the onions, red bell peppers, garlic, cilantro, fennel, and salt.
2. Sauté over medium heat for 8 minutes, or until onions are transparent. Add the water and cornmeal. Bring to a low simmer and cook for 15-20 minutes, or until mixture is soft and thick.
3. Stir in the beans and olives. Transfer mixture to a greased 2-quart loaf pan; cover and let set for 30 minutes.
4. To serve, cut in 1/2-inch or thicker slices and serve with a mix of vegetables for a complete meal.

*Corn grits can be substituted for cornmeal. Because corn grits must cook about 30 to 40 minutes and the water ratio and cooking time are double that of cornmeal, directions for the recipe will change. If substituting corn grits for polenta, use an extra cup of water and cook an additional 10 to 20 minutes until polenta is viscous or of the consistency of traditional cornmeal polenta.*
An incredible variety and amount of beans are produced in Central America.

In these years, the production of pulses (as a percentage of total agriculture in the region) has shrunk considerably.

In 1991, the average value of pulses was 4.1%. In 2011, it was 1.4%.
Mayan legend has it that a poor farmer was approached by Kisin, an evil being in Lacandon mythology, who told him that in seven days his soul would be taken to hell, but that for each of his remaining days he would be granted a wish. The ingenious farmer asked him, in the following order, for money, health, power, food and to travel and fulfil his dreams. On the seventh day, he asked Kisin to help him wash the black beans until they were white. This was an impossible task, since only one variety existed at the time. It is said that Kisin, dismayed, created beans in every colour so that he would never be tricked again.

Allegories aside, recent international studies like those carried out at the Università Politecnica delle Marche in Italy, place the origin of the bean, the *Phaseolus vulgaris*, in Mesoamerica and not in the Andean region as previously thought. This would help to explain the undeniable
FAO INTERNATIONAL YEAR OF PULSES
influence of beans in pre-Columbian cultures such as the Olmec, Maya, Aztec, Mixtec, Tarascan, Teotihuacan and Zapotec civilisations, to name the most significant ones. Radiocarbon tests have made it possible to determine that certain spontaneously-growing beans found at archaeological sites are around 10,000 years old. It is known that in the seventh century BC, crops were already grown in the region, making them older than maize and one of the most ancient foodstuffs documented in the history of humanity. The wide variety of beans — whether in colour, size or shape — reveals the biological diversity that must have already existed at the time. It also lends weight to theories that these crops would have been traded between cultures, and even used as currency or for taxation. The records of the Codex Mendoza, for instance, show levies received by the Triple Alliance of the Valley of Mexico in the form of beans.

The importance of beans in the indigenous diet, along with the diversity of varieties, were chronicled by religious and military officials involved in colonising the region. Captain Gonzalo Fernández de Oviedo Valdés, for instance, in his Historia general y natural de las Indias, islas y tierra firme del mar océano (General and natural history of the Indies, islands and mainland of the ocean), a sixteenth-century work, describes the rich plant life of Central America. It highlights the importance of pulses, and in particular, their significance on the isthmus and in the Caribbean (where Christopher Columbus himself found strange crops, “very different beans to our own”). Needless to say, pulses continue to be a central part of the culinary traditions of Cuba, the
Dominican Republic, the Antilles, Honduras, Nicaragua and El Salvador. It is also accepted among food historians that following the arrival of the Spanish in the Americas that beans began to cross the ocean. Spain proved particularly receptive in terms of cultivation and culture and soon they spread throughout Europe. In return, Europeans brought chickpeas to the Americas, and although they never became as prevalent as beans, they adapted very well to the climate of northern Mexico; today, the leading producer and exporter of the pulse in the region, where it is known as the chícharo.

Mexico, with a population of well over 100 million, was also the first country to be granted UNESCO Intangible Cultural Heritage status for its cuisine, mainly due to certain culinary methods that have survived since ancient times, and ingredients such as maize, chilli and beans. This pulse is known in the ancestral language of Na’huatl by the generic name etl, a word for beans found in many culinary terms handed down through the ages.

The ancient bond between Mexicans and beans has resulted in their being featured in over half of the country’s national dishes, extending across each and every region. Beans are such an important part of the Mexican diet that, despite the huge volume of production, the bulk of the crops grown are for domestic consumption. Lentils, another pulse steeped in traditional Mexican cuisine, in contrast are grown primarily in the states of Michoacán and Guanajuato, but whose local production only meets a small proportion of national demand.

Lentils first came to Central America with the Spanish colonisers, and are found in wonderful local recipes, some even including fruit. In Oaxaca they make a lentil soup with pineapple, banana, belly pork, sausages, black pudding, onion and garlic. In Puebla, lentils are first boiled in water and then cooked in a stew with poblano (a mild chilli), tomato, garlic, oregano and cinnamon, with some adding ripe wild banana for a wonderful taste sensation.

Cooked beans are mashed or blended and then fried in lard until all liquid has simmered off. This creates a thick, soft paste with a compact texture. The resulting refried beans are the most popular way to eat pulses in Mexico and Central America. You will find them accompanying any meal, or spread on bread and used for antojitos (Mexican street food), as a tasty complement to the other flavours.

Mexico grows the lion’s share of chickpeas consumed in Latin America. Although less popular than beans in Mexico, this versatile pulse, whether roasted, toasted, salted or with chillis, can be found in soups and stews, often accompanying poultry dishes, in desserts such as honeyed chickpeas and in botanas (appetisers). Chickpeas are often sold in markets pre-soaked and in transparent bags, ready for cooking to your heart’s desire.

What’s in a name? Mexico, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Puerto Rico call bean plants plantas del frijol. Bean pods are called ejotes (from the Na’huatl exotl), although in Costa Rica they go by the name of vainicas. In Panama, red kidney beans and black turtle beans are porotos while throughout nearly the entire Caribbean they are habichuelas, meaning little haba or broad bean (stemming from the Latin faba, meaning bean), since they look like their larger relative.
03

BEANS. VALUE OF PRODUCTION
The value of beans rose sharply from 2011 to 2013.

1990-2013
Average value
847,26
Million USD

04

PRODUCTION OF BEANS
Production levels have remained relatively stable over these years.

2010-2014
1 718
THOUSAND TONNES

05

QUANTITY OF IMPORTS PER TYPE OF PULSE*
Beans are by far the largest import in Central America.

06

QUANTITY OF EXPORTS PER TYPE OF PULSE*
Central America’s main exports are chickpeas.

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
MEXICO CITY
(MEXICO)
Chef Ricardo Muñoz Zurita.
The Aztec Empire… for millennia Mexico has a culinary history that has continued up to today. Starting with the country’s farming traditions and unusual growing techniques and accompanied by community systems, along with a sensitivity to infuse its ancestral influence; all factors that have carried Mexican cuisine to be recognised as a World Heritage in 2010.

The declaration came about thanks to an initiative promoted by Mexico’s Conservatory of Gastronomic Culture, a private institution that first envisaged the possibility of a national cuisine obtaining World Heritage status. Years earlier, five Mexican chefs led by Ricardo Muñoz Zurita paid a visit to UNESCO headquarters in Paris. To make their case, they brought with them a virtual farmer’s market – 40 kilos of authentic Mexican produce: escamoles, huitlacoche and chapulines; Puebla, black and yellow mole; 120 kinds of chilli, epazote, achiote and quelites; pumpkins and squash, black sapote pulp, and no fewer than 50 native varieties of beans. “Taking our basic staples of maize, chilli and beans, combined
with pre-Hispanic cooking methods, were the reasons for insisting,” says chef Muñoz Zurita. He did not back down when faced with committee scepticism over what to do with a 40 kilo dossier.

For Muñoz Zurita, Mexico and arguably Latin America’s undisputed top chef, beans are synonymous with Mexican cuisine. He is well aware that times change and with social transformation comes new urban eating habits, changing diets and influence by global trends and classism. And while rural traditions can often go relegated to the dust bin of the past, in Mexico, beans remain a daily staple in a country where over 100 varieties are produced.

Muñoz Zurita points out that the *milpa* – the ancestral agro system of Mesoamerica that produces bean and maize crops – is consistent with systems developed by other civilisations around the world. In other words, soya and rice in the East, beans, chickpeas and wheat in Africa, beans and maize or wheat in the Americas, and beans, chickpeas, lentils and wheat throughout Europe owe their growth to early Mexican farmers.

It is widely known that natural growing cycles and eating habits have brought us to eat pulses and cereals together, thereby increasing the nutritional potential
Chef Muñoz Zurita in his restaurant Azul Condesa preparing a bean salad.
of proteins. This practice produces a synergistic effect that, in the case of beans, triggers an abundance of lysine, an essential amino acid that, as the chef states, “Aids collagen formation and calcium absorption in the body, maintains the nitrogen balance in adults, is very useful in the production of antibodies and stimulates the growth hormone.”

Ricardo Muñoz Zurita was born in Mexico City in 1966. He was named the Prophet and Preserver of Culinary Tradition by Time magazine in 2001, one of many distinctions, like his membership in the Académie Culinaire de France. After gaining his first experience in his parents’ family restaurant, he trained as a chef at San Diego Community College in California, Le Cordon Bleu in Paris and the Culinary Institute of America in New York. He is the founder and manager of Azul y Oro Café in Mexico City at the university’s Cultural Centre, and owns two leading centres of Mexican cuisine, the Azul Condesa and Azul Histórico restaurants housed in unique premises in the capital’s historic centre. He has authored a vast number of culinary publications, including the monumental Diccionario Enciclopédico de Cocina Mexicana (Encyclopaedic Dictionary of Mexican Cuisine), published in 2013; the product of 22 years of work. It devotes over 100 entries to beans alone. Even so, he says, this “falls short” of reality, given the endless possibilities of beans in Mexican cuisine.

Muñoz Zurita insists that more pulses should be included in our diets, particularly in large cities, where new, global, standardised and foreign habits have taken root. The nutritional properties of beans are unquestionable, while access is readily at hand: “It’s quite easy and economical to buy dry pulses,” he insists. He does admit, however, that a busy modern lifestyle isn’t suited to the slow-cooked stews in which pulses often feature. The absence of a family member whose role is to be in the kitchen means that for many, beans are starting to be seen as a nostalgic reminder of homemade cuisine. To counter this, Chef Muñoz Zurita praises the pressure cooker and timers on cooking equipment, which have sped the process and made timing more precise. “Another useful alternative,” the chef suggests, “is pre-cooked or powdered pulses, prepared by reputable brand names and preserved perfectly in cans, sealed, or vacuum-packed – retaining the pulses’ nutritional properties – while making our lives easier and making room for pulses.”
Frijol Colado

Serves 6

Place water, beans, onion and garlic in a pressure cooker on high heat for 1 hour. When the safety valve begins to hiss, remove from heat and leave to cool until the safety valve has gone down. Remove lid and check that the beans are tender. Return the pan to medium heat, add salt, and cook for 10 minutes uncovered, then remove from the heat. Drain beans, making sure to keep the cooking liquid aside separately. Discard onion and garlic and place half the bean liquid and beans in a blender.

Blend to a thin, smooth consistency that passes through a strainer leaving almost no pulp, and set aside.

**FOR THE FRIOLES COLADOS**
- 2 Tablespoons vegetable oil (30 ml)
- 1/4 white onion, finely chopped (60 g)
- 6 epazote leaves, finely chopped
- 1 roasted whole xkatik chilli* (50 g)
- Blended bean mixture

Heat oil in a saucepan on high heat until it starts to smoke. Add onion and fry until translucent. Add the epazote, xkatik chilli and blended beans and mix, cooking over low heat for 20 minutes until the beans thicken, without letting them dry out. Salt to taste, remove from heat and set aside.

This preparation is a base for many recipes, such as panuchos and papa negro, and can also be served with meat, fish or as a main course. It can be prepared with canned black beans to shorten preparation time.

* Yellow and elongated, also called güero chilli

**INGREDIENTS**

- 2 litres water
- 400 g black beans, soaked 12 to 24 hours in 4 cups of water and then drained
- 1/4 medium whole white onion (60 g)
- 3 large garlic cloves, peeled and halved (12 g)
- 1 level tablespoon salt (20 g)
SOUTH AMERICA

01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2010 - 2013)
Beans are by far the most produced type of pulse in this region.

02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE
In these years, the value of pulses decreased by more than 50%.
Even though recent studies suggest that beans originated outside the Andean region, it took no time before they were considered wholly South American.

This pulse is a staple for millions of people there. Their status is largely due to the bean’s historic acclimatisation and early domestication leading it to evolve its very own gene pool in the South American sub-region (like the bean found at the ancient Cueva del Guiterrero site in Peru).

Accordingly, there is a startling array of names to describe the pulse: frijoles, fréjoles, frisoles, feijões, kumandas, porotos, granos and caraotas, to name just a few.

No surprise, then, that the region is home to the International Centre for Tropical Agriculture (CIAT), located in the Colombian Department of Valle del Cauca. This collaborative research body works to improve agricultural productivity and the management of resources of tropical countries. Among the CIAT’s many areas of activity, is the bean. The Centre houses the largest quantity of germplasm of bean...
varieties preserved worldwide, and undertakes sophisticated experiments to make these plants more resistant to disease, heat and low-phosphate soil. Researchers strive to increase micronutrients of beans and improve upon the natural nitrogen fixation of pulse roots, which is so highly beneficial to the environment.

Beans are central to the rich cuisines of Peru and Colombia, two countries shaped by countless influences throughout their histories. Indeed, their lexicon is imbued with terms such as *chifa*, *nikkei*, *criolla* and *paisa*, referring to dishes influenced by a mix of various cultures. During several decades of the 20th century, different varieties evolved to adapt to the various climate and soil conditions of Peru’s coastal region, stretching from Ecuador to Chile. The result is that this area now forms an important production belt spanning some 3 000 kilometres.

In countries like Bolivia, Ecuador, Uruguay and Venezuela, this pulse is a dietary staple due to its high yield, low cost and high nutritional value. While the Southern Cone features some important dry pulse-producing regions in the Argentine provinces of Buenos Aires, Córdoba, Jujuy, Salta, Santa Fe, Santiago del Estero and Tucumán. The *Puy* lentil and the chickpea, grown mainly in Argentina, Chile and Peru, are also common in South America, while other pulses such as butter beans are similarly important to the region.
SÃO PAULO (BRAZIL)
3. The Brazilian chef Helena Rizzo selecting pulses in the market Pinheiros. 4. People enjoy drinks and snacks under Brazilian flags at Mercado Municipal, a historical indoor market decorated for the World Cup in Sao Paulo. 5. A vendor fills a bag of beans for customers at the Municipal Market.

BELEM (BRAZIL)
6. A man prepares the traditional meal of fried fish with the regional fruit acai inside Ver-o-Peso market, an open air market where merchants from around Para State sell products from the Amazon, ranging from fruit to medicinal plants, in Belem.
One country deserves special mention, given its demographic and geographical size: Brazil, which has a longstanding tradition of feijões (black beans). This versatile pulse is an ingredient of its national dish, feijoada, a unique speciality in the culinary world. Depending on the ingredients, it can go from the most humble, rudimentary dish, to a delicacy fit for a royal banquet. According to texts like Luís da Câmara Cascudo’s História da Alimentação no Brasil, this is due to the fact that the dish takes its origins from banquets held by plantation owners; leftovers would be collected by slaves and labourers who used them to make a tasty, low-cost meal. The dish is now an institution, as likely to be seen in a luxury hotel as it is in the most humble of households. Its nutritional value stems from a combination of the feijões’ excellent plant protein, the stewed pork, and high-grade carbohydrates in the form of rice or farofa (cassava flour essential to Brazilian cuisine). It can even be combined with vitamin-rich fruit (especially oranges, originally consumed to prevent scurvy) and any other ingredient that the imagination and resources allow.

Another leading Brazilian recipe featuring pulses is tutu a mineira, a humble meat and black bean stew made from the leftover broth from feijoada or feijão preto, thickened with farofa and seasoned with chilli, pepper and garlic. And while chickpeas are fairly rare in the country and seldom grown or consumed, lentils are quite popular in Brazil, though almost all lentils are imported. Brazilians have even adopted the Italian tradition of eating them on New Year’s Eve in the belief that they bring prosperity.

Curiosities

In the last century, Brazil, with its landmass accounting for almost 50% of South America and its renowned enthusiasm for pulses, seemed like the ideal country to absorb Mexico’s plentiful chickpea surplus. The mission was entrusted to famous writer and gastronome Alfonso Reyes, the Aztec country’s ambassador to Rio de Janeiro from 1936 to 1937. Chickpeas, known in his homeland as granos de pico (peaked grains), were virtually unknown in Brazil. In his Memorias de Cocina y Bodega, Reyes explains how Dulce, his Brazilian chef and accomplice, promoted his cause. Instead of calling them garbanzos, she presented them at embassy lunches as bragancos – a direct reference to the famous Portuguese Braganza dynasty which ruled the Brazilian Empire before independence. The ambassador jokingly attributes the introduction of the Mexican chickpea to the Brazilian market precisely for this subtle rebranding. To this day, the chickpea remains popular in Brazil.

The feijoada Maní is the most innovative interpretation on record of Brazil’s national dish. It was created by Helena Rizzo and her husband, chef Daniel Redondo in 2009. It occurred to them during a trip to Spain, when the famous chef Ferran Adrià developed the culinary technique, spherification, which uses calcium lactate gluconate and alginate, two ingredients that have a magical aesthetic effect on food. Inspired by this method, they returned to use it on the Brazilian black bean to create their own gastronomic synthesis of the famed feijoada.

Judía, frijol, poroto, haba, habichuela, feijão, fréjol, frisol, fríjol, fréjol and frijón are all words denoting beans in South America, often with different stresses, like in the plural fríjoles, in Colombia, the first syllable is accented instead of the second.
**03**

**BEANS. VALUE OF PRODUCTION**
Beans have doubled in value in the past ten years.

**1990-2013**
Average value

**1 815.73 Million USD**

**04**

**PRODUCTION OF BEANS**
Production levels have remained fairly constant.

**2010-2014**

**3 801 THOUSAND TONNES**

**05**

**QUANTITY OF IMPORTS PER TYPE OF PULSE**
South America imports roughly 50% more than its exports.

**06**

**QUANTITY OF EXPORTS PER TYPE OF PULSE**
Not surprisingly, beans are South America’s highest exports.

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* Average 2009-2013.

The figure for total exports and imports include other pulses that are not listed.
SÃO PAULO (BRAZIL)
Brazilian chef Helena Rizzo with some of her pulse speciality dishes.
Cosmopolitan flavours and new techniques are central to professional cookery in the world’s metropolis. Sometimes, chefs find themselves beholden to the trends and tastes sizzling around an urban environment. São Paulo, for example, has been moving towards more Italian or French ingredients and flavourings. Traditional charcoal grill houses are transformed into buzzing social scenes, keeping in step with the growing status derived from the country’s pastures and cattle. While on the home front, beans, cassava and rice remain the main staples, a healthy dietary legacy of colonial Brazil. And while some of the city’s most popular restaurants like A Figueira still offer a tremendous weekly service of the mainstay feijoadas, testifying to the lasting importance of this national dish, it would appear that an awkward classist attitude has arisen; one that tends to snub popular, traditional
dishes in favour of more trendy tastes. And with it, reducing the prominence of locally grown produce and traditionally prepared stews and diminishing the presence of pulses in some of the best known eateries.

World-famous Brazilian chef, Helena Rizzo, has set out to singlehandedly buck this trend and boldly reinstate the humble pulse. Her signature feijão da served up on weekends at her restaurant, Maní, restores Brazil’s prized dish to its rightful place; positioning it among a host of innovative dishes made using modern techniques. Chefs incorporating progressive cookery methods into more traditional methods, are succeeding in creating some of the finest examples of local cuisine. Sous-vide cooking techniques and alginate solution are part of Rizzo’s armoury, while pork ribs and trotters, beef shanks, sausages, chicken, chestnuts, walnuts, orange slices, cabbage and other vegetables, but above all, beans, still feature in her at once stately and humble version of Brazil’s most historic dish.

And the results speak for themselves. In 2013, Helena Rizzo was judged to be the top chef in all Latin America. Straight from this accolade, she was crowned World’s Best Female Chef in London in 2014, recognised by the same panel of food critics that compiles The World’s 50 Best Restaurants annually. Maní appears on this lofty list at number 41. In 2015, Rizzo garnered a star in the first Michelin Guide to Brazil,
and her eatery was selected as the city’s best contemporary restaurant in the 2015 Ver São Paulo lifestyle magazine. Maní is situated in the sophisticated district of Jardim Paulistanom, and its name evokes the indigenous goddess of cassava, who according to legend, was buried in the place where the most highly prized root in the Brazilian diet first grew.

Born in Rio Grande de Sul, in Porto Alegre in 1978 — the state that borders Uruguay and Argentina and where inhabitants are known as Brazilian gauchos — Helena studied
architecture during her brief stint at university. At 18, she moved to the seething city of São Paulo, starting work as a model, before becoming involved in cooking with Fasano, one of Brazil’s most famous hotel groups. After running the Na Mata Café kitchen, she travelled to Europe, where she worked in restaurants in Italy and Spain. At the Cellier de Can Roca in Girona, Spain (at that time considered the best restaurant in the world), she was introduced to the idea of cooking as an art form. Working alongside Daniel Redondo, who she met there and married, in 2006 she opened her own restaurant, Maní.

Committed to using fresh, local, seasonal produce and primary flavours, Helena’s dishes are in tune with natural cycles, sustainable farming and native Brazilian products. She uses suppliers who carefully select their pulses, like Antonia Padvaiska, of Emporio Piotara, who supplies her with an excellent local variety of butter bean – the manteiguinha del Norte – or the Coruputuba farm, in the Paraiba Valley, her source of cow and pigeon peas. “We are lucky to take advantage of such a wide variety of dry beans as we have in Brazil,” says Rizzo, “Not only the manteiguinha and black bean, we also use pigeon peas at Maní, a pulse that was widely consumed in the past, but fell out of favour. But now, some producers have started replanting it and extolling its virtues, with the result that it has been welcomed enthusiastically by young chefs.”
**SERVES 4**

**COWPEAS with CLAMS and MUSHROOMS**

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**SOAK**

Soak beans in water for 24 hours and drain.

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**BOIL**

Boil in fresh water for 1 hour 40 minutes, adding salt to taste, bay leaves and ham.

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**REMOVE**

Remove bay leaves and ham.

---

**BLEND**

Blend a third of the beans and their liquid into a very smooth purée. Mix back in with the beans.

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**SAUTÉ**

Sauté the mushrooms in a hot pan with a trickle of olive oil and a pinch of salt and add the mushrooms to the stew.

In a medium-sized saucepan, lightly brown the garlic in the remaining olive oil. Add the clams, white wine and half of the parsley and coriander.

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**REMOVE**

Remove the clams with a spoon as soon as they begin to open.

Before serving, add clams to stew along with salt to taste and the remaining coriander and parsley.

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*Vigna unguiculata*, also known in Brazil as frijol-to-string
01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2009-2013)
A glance at the production of different pulses in Europe shows that dried peas are the most produced in the region.

02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE
In Europe, the value of pulses was less than 1%. Over the years, pulses continued to decrease in importance to being only 0.29% of crops produced in Europe in 2012.
“I am unfamiliar with the history of beans on other continents, but surely even without European beans, the history of those continents would have been different, just as the commercial history of Europe would have been different without Chinese silk and Indian spices”. So opined author and semiologist Umberto Eco in a famous article in *The New York Times Magazine*. Displaying both sage judgement and sound evidence, the Italian writer claims that pulses literally saved Europe. He cites that after the long agricultural revolution following the fall of the Roman Empire, people’s principal source of protein was beans and lentils. These spurred on a process of domestication and storage that helped to repopulate the continent during one of its darkest times.

Although people could reap the benefits of pulse protein anywhere in the world, perhaps because pulses were a relative novelty, the Europeans not only embraced them, but made them their own. In fact, looking at traditional recipes across the continent, we find lentils, chickpeas and bean dishes from Norway to Cyprus, from Portugal to Russia, and even in the outermost regions such as the Canaries, the Azores and the French territories. It goes without saying that in certain regions, pulses not only provide a great source of food and nutrition, but are even cultural landmarks. Such is the case of the vast range of...
pulses from Italy’s Emilia-Romagna region, or the devotion to green lentils in Puy or to the Occitan white bean cassoulet of France.

But Europe is also central to the world map of pulses as the point of convergence for the greatest culinary globalisation in history; a process starting with the explorations of Christopher Columbus and resulting in pulses from Asia meeting their counterparts from the Americas. This gastronomical exchange carried pulses to the four corners of the earth, creating an unprecedented revolution of taste and cultural crossover. Without trade, we would not have seen chickpeas in the Americas and certain kinds of beans in Asia. In the 16th and 17th centuries, the Spanish Empire, the Dutch East India Company (the world’s first multinational) and the British and Portuguese crowns were the vehicles that transported these products, perfectly preserved, from agent to agent, colony to colony, and port to port. Works of such universal standing as Miguel de Cervantes’ Don Quixote feature a wide variety of dishes, pointing to the rich tradition of pulses by this time, and include references to products within everybody’s reach, like chickpeas.

Nowadays, Spain is amongst those countries that are true benchmarks when it comes to pulses; perhaps not in terms of production, where it pales in comparison to countries such as India and Canada, but

MADRID (SPAIN)
1. Traditional corner shop in Plaza Mayor. 2. Two men having a snack outdoors in the vicinity of the Plaza Mayor. 3. Food stall in the San Miguel market. 4. and 5. Varieties of beans. 6. Alimentacion Cabello, located in the Plaza de Matutes, is the oldest shop selling pulses in the city. 7. and 8. Varieties of pulses on display in the market de la Paz. 9. Showcasing pulses in Alimentacion Cabello. 10. Cocido Madrileño (typical Spanish stew with pulses) in the restaurant La Bola.
Photographs on this page and the next were taken by Thomas Canet
definitely in terms of diversity and quality produced. There is no other European country that offers such a wide range of pulses, often bearing proud EU labels as a protected designation of origin or a geographically traditional specialty. Indeed, there is no other country where pulses appear so frequently in traditional cuisine.

In Spain, chickpeas are the mainspring of more than twenty different types of cocido (a type of stew) served across the country. It is enjoyed from the capital city of Madrid to Galicia in the northwest, or made in a variant called puchero in the Canaries. Those in the know are particular fans of Castilian interpretations from Fuentesaúco (Zamora) and Pedrosillo (Salamanca).

As for lentils, La Armuña (Salamanca) is home to a delicious variety, with their soft skin and smooth and even texture. They feature in hundreds of traditional recipes and modern creative reinterpretations from the country’s top chefs. Spanish beans deserve a full mention too, with some originating in the Middle East and others in the Americas. Asturian beans (fabas asturianas) are one of the leading lights for high-quality Spanish pulses, but equally excellent varieties can be found in La Bañeza (León), Tolosa (Guipúzcoa) or even the Judión de la Granja (Segovia) variety which was originally animal fodder before it became the love of gourmets. And how could we forget beans from El Barco (Ávila), Ganxet (Barcelona), Guernica (Vizcaya), red kidney beans from La Rioja and Ibeas (Burgos); each and every one of them standing for farming excellence and meticulous methods of production, inextricably linked to each of the regions where they are grown.

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**Cassoulet** is France’s most typical dish featuring pulses. Originally from the southeast of France, it is a stew made of white beans with Toulouse sausages, streaky bacon and pork loin, all cooked in goose fat. In northeast France, Breton-style beans with tomatoes are famous, and elsewhere you can find Provençal bean soup with pistou (a paste made of basil, garlic and cheese) as well as Puy lentils. These even get turned into the sweet preserve Confiture de lentilles by the Sisters of Saint John, in Murat (Auvergne), in the southeast of France.

**Hutspot**, or hotchpotch in British English, is a thick mash made with meat, vegetables and chickpeas created in Leiden (Netherlands). It is the traditional dish commemorating their victory over Spanish troops in 1574. According to the plaque marking this day, Hutspot is similar to the tasty stew the Spanish army left behind after their retreat, and it helped feed the starving and besieged inhabitants of the town.

**The lentil stew known as Linseneintopf** is one of few German dishes in which pulses play a leading role. It is made with belly pork, celery and potatoes and comes from Göttingen in Lower Saxony, where it is considered a staple of the University of Göttingen, founded in 1734.

**Cocido castellano**, also called cocido madrileño, pays homage to chickpeas, the pulse most often associated with Spain. A rural and unpretentious dish, the Lhardy restaurant in Madrid added it to the menu in 1839. Its main ingredient has taken pride of place in Spain as the emblem of the Spanish capital’s oldest dining club, El Garbanzo de Plata (The Silver Chickpea). It is quite an honour to be invited to wear the silver chickpea badge! Even dried chickpeas are used to put up a stake in Spain’s most popular card game, Mus.
**03**

**DRY PEAS, VALUE OF PRODUCTION**
The value has increased steadily from 1990 to 2013.

**1990-2013**

*Average value*

**73.3**

*Million USD*

**04**

**PRODUCTION OF DRY PEAS**
Levels fell steadily since 1990 and only from 2012 that farmers began to produce more dry peas in Europe.

**2010-2014**

**3 550**

*THOUSAND TONNES*

**05**

**QUANTITY OF IMPORTS PER TYPE OF PULSE***
Europe imports a total of 1 718 000 tonnes of pulses each year.

**06**

**QUANTITY OF EXPORTS PER TYPE OF PULSE***
On average, Europe imports slightly more than it exports, namely 1 638 000 tonnes each year.

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*Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.*
MADRID, (SPAIN)
Spanish chef Abraham García in his restaurant, Viridiana.
Glance at the menu at Viridiana, Abraham García’s restaurant in Madrid, and you will always see pulses amongst the specialities. The humble pulse is not typical fare for top European restaurants, but Viridiana has been a quality eatery for 40 years. According to the food critic at the International New York Times, it is one of the ten best bistros in the world, a claim backed by Marie Claude Decamps of France’s Le Monde.

Viridiana’s owner and head chef virtually heralded in multicultural cuisine in Spain, a navigator

The Spanish chef Abraham García choosing pulses in Casa Ruiz.
taking then-conservative Spanish palates on a journey of cosmic fusion where to experience a wider world of flavours. Such cutting-edge aspirations strengthened rather than weakened his love for the honesty of pulses. He researches and creates new tastes with pulses, always widening their gastronomic appeal. He presents revolutionary dishes like Basque black bean stew, okra and Antarctic stone crab stew and stews seasoned New Orleans-style with chilli peppers and Cajun spices. These are but a small sample of the creative spirit with which Abraham is infusing pulses, so they can leap out of the past and onto plates.

Abraham García is a chef who is at once impulsive and sensitive, learned and primal, intuitive and sophisticated – like so many genuinely great
**Tapas**

Tapas are Spain’s most popular side dishes. They are an important part of a kind of casual cuisine that frequently accompanies drinking alcoholic beverages. Tapas can satisfy hunger pangs, they accentuate the friendly ambience of bars where tapas has become a way of life – eating tapas, being with friends, and going from place to place. This is a ritual that makes life in Spain different from anywhere else.

Anything is possible and allowed when enjoying tapas, and pulses have their rightful place there, too. A few examples from Chef Abraham García:

"A feira" octopus on a bed of fried chickpeas

1. Fry chickpeas in a little oil on medium heat, adding the garlic shoots towards the end.

2. Serve the chickpeas and garlic shoots on eight separate plates and place thin slices of octopus on top.

3. Sprinkle the paprika, drizzle a line of oil and add a little coarse salt.

- **8 tapas**
- **2 octopus tentacles, cooked and cooled**
- **4 garlic scapes (shoots), peeled and cut into thin sticks**
- **400g chickpeas, cooked and drained**
- **Extra virgin olive oil**
- **Paprika 10g**
- **Coarse salt**
Abraham is a writer too, and in his works literature and food mingle, such as in Abraham Boca and Recetas para quitarse el sombrero (Recipes to take your hat off to).

With literary prowess, he quotes the physicist and poet Agustín Fernández Mallo, who believes that “The reason we love to sit at a table and eat together is because the raw material we pick up at market...”

chefs. He also has strong beliefs about what food should be, and his daily trips to the markets are translated into his ever-changing menu. And this penchant is not reserved for perishables like fish and vegetables, but rather Abraham brings an unbridled curiosity for new and unexpected tastes he can create together with a variety of pulses waiting for him in his kitchen, soaking in water from the night before.
Chickpea and Cod Stew with Spinach and Pine Nut Fritters

Serves 4

1. Place the chickpeas in warm water and soak for 12 hours. Drain.

2. Place the soaked chickpeas in a pressure cooker, cover them in water, then add the vegetables and a trickle of olive oil.

3. Put the spinach to one side, and then blend the other vegetables with some of the cooking liquid.

4. Place the blended vegetables in a saucepan together with the chickpeas and cook on low heat.

5. Fry each slice of bread together with the almonds and the saffron.

6. Once fried, grind the bread, almonds and saffron with a pestle and mortar and add it to the saucepan.

7. Drain the spinach, roll it into a ball, and then chop it roughly.

8. Mix the spinach with the beaten eggs, toasted pine nuts and chopped parsley.

9. Shape the spinach mixture into small bite-size pieces the size of a spoon and fry them in oil on high heat until golden.

10. Cook the spinach fritters in the stew for 30 minutes. While it’s cooking, add the flaked cod. If using salted cod, ensure you soak it first to remove the salt.
is already dead.’ Cooking it, serving it and savouring it is the same as bringing it back to life.” This brings an awareness of the passing of time, marked by our own inevitable death and magical resurrection.

This tenet is particularly true for pulses. Indeed, Abraham believes that the life cycle of pulses responds to this idea more so than any other product: from its height of freshness as a plant (which implies freezing and thawing for some varieties) its providential fossil record when dried, to its recovery when soaked, it is given new life in dishes fostering the chef’s inspiration and meals shared by friends.

Abraham knows full well that pulses exercise a decisive role in Spain’s culinary traditions. From severe stews with michirones which require soaking for 48 hours before an uncertain cooking process; to the surreptitiously subtle taste of a chickpea flour paste that must be used ever so sparingly (something that people realised only after overeating it in times of famine).

Abraham García was born in the countryside of Robledillo (Toledo), a tiny hamlet in La Mancha. During his bucolic childhood he was a curious rebel. He would go on to train in the great restaurants of Madrid (Coro, Jockey, Club 31), but never forgot the basics he learned at home, such as the family recipe called “Three handfuls” (beans, chickpeas and...
Mussels on a Bed of Verdina Beans with a Peach and Chilli Vinaigrette

Serves 8

**Preparation:**

1. Steam the mussels and remove one shell. While cooling, prepare vinaigrette made from mixing equal quantities of all of the finely chopped ingredients adding a generous amount of oil, lemon juice, Jerez vinegar, and Dijon mustard, Tabasco sauce and coarse salt.

2. When mussels have cooled, cover them with the vinaigrette and serve atop a bed of Verdina beans.

- 2 Kg mussels (steamed open and with one shell removed)
- Lime juice
- Extra virgin olive oil
- 500 g or cooked haricot beans
- Capers
- A few drops of Tabasco
- Red onion
- 1 teaspoon of Dijon mustard
- A few drops of Jerez vinegar
- Pickled gherkins
- Parsley
- Dried peach
- Coarse salt
lentils). This dish intuitively foreshadowed the science of creating a healthy range of vegetable protein by serving pulses with a handful of rice thrown in for good measure.

Spain has a range of pulses that proudly bear their own names, seasons and both simple and sophisticated regional dishes. Nothing is foreign to Abraham in the culinary miracle that is pulses, the most reliable meal all year-round. He loves fabada asturiana (Asturian bean stew) for its immutable rigour; the many types of white beans in Leon, Palencia and Segovia; black and red beans from Tolosa and Guernica, reaching almost holy status when served with local sausages morcilla de puerro and morcilla de repollo; delicate and moist red kidney beans from La Rioja; and garrafó beans that make paella more hearty or add joy to any salad. To this we can add Pardina lentils, Beluga lentils and green lentils, all with their serious character yet so quick to prepare. But, above all, there is the generous chickpea that can do it all – the star of both everyday stews and the stellar version that Abraham only prepares to order. Invariably a one-off, since it is never the same way twice, just as it should be each and every time, for an eternity.
**Scallops with Lentils and Sobrassada**

**Serves**: 8

- **8 Large Scallops**
- **300 g Lentils** (if unshelled, soak overnight)
- **50 g Sobrassada** sausage, skinned
- **1 Carrot**
- **1 Leek**
- **1 Onion**
- **1 Medium-Sized Potato**
- **2 Garlic Cloves**
- **Salt**

**Preparation:**

1. **Drain lentils and cook with vegetable stock in a pressure cooker.**
2. **Remove the vegetables and mix with some of the cooking liquid with a hand blender.**
3. **Add the sobrassada, making sure to bind the mixture so it stays thick.**
4. **Taste and season, then serve into eight small clay bowls.**
5. **Steam the scallops, remove the meaty part and place one scallop in the centre of each bowl, on top of the lentil and sobrassada purée.**

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**Sobrassada**: A delicious, soft sausage made in Majorca from pork and paprika.
01 QUANTITIES PRODUCED BY TYPE OF PULSE
Chickpeas, closely followed by lentils are the crops most produced in this region.

02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE
In these years, the value of pulses has fallen by a third.
Lentils are the first pulse described in the Bible, which later also cites the perfect marriage between pulses and cereals. This first reference occurs, appropriately, in the book of Genesis.

In it, Esau gives up his birthright to Jacob for a bowl of lentil stew. The dish is initially referred to as a “red stew”, suggesting that the lentils they ate were usually split and possibly seasoned. The same text also tells the story of the Jews chosen to serve Nebuchadnezzar after his campaign against Jerusalem. Daniel and the other young men asked the king for water and pulses rather than the other delicacies that were offered to them. Though this odd request at first disconcerted the people responsible for feeding them, after several days, the greater health benefits of the lentils became clear.

The remains of domesticated lentils and chickpeas found in excavations at Hacilar, Turkey, and Jarmo, in Iraqi Kurdistan, led to the conclusion that these crops have been consumed in the
area for at least 8 000 years. In the region of Palestine, where people lived in the contrasting landscapes of arid desert and the rich terrain of the Asi valleys and Jordan, advanced planting and harvesting techniques were developed. Broad beans and lentils played a vital role in bringing about stable settlements, making the region a Phoenician supply point.

The natural wealth of the strip of land between the Tigris and the Euphrates rivers also gave rise to important ancient cities like Babylon. It is widely accepted that the earliest structured writing system was developed in Mesopotamia around 3 200 BC, and evidence suggests that this innovation was a result of the need to control agricultural production and taxes on its output.

Dried lentils, broad beans and chickpeas would have played a vital role in the evolution of this early civilisation due to their long shelf life. Many of the pulses we now know came from this part of the world, unsurprisingly the same region where the first examples of domestication of these crops were found and the subsequent spread of these varieties were first traded.

Pulses are still a very important part of the region’s cuisine. Iraqi and Iranian cuisine (with their roots in ancestral Persian, Assyrian, Babylonian and Sumerian traditions), as well as Arabian, Syrian, Jordanian, Azerbaijani, Armenian and
Eastern Europe and Western Asia
Israeli cuisine (and even the more rudimentary Qatari, Omani and Yemeni cuisines) share many recipes for pulses which differ in little more than their name. This is the case of *fasoulia*, a typical bean stew that can be found anywhere, from Greece to the southernmost part of Arabia.

There is no doubt that the tradition of eating a selection of small dishes typical to the region, widely known by the Persian term, *mezze*, has propelled the global reach of various pulse-based dishes, such as *leblebi*, *hummus*, *borani* and *falafel*, all of them made from chickpeas, or lentil salads and bean purées, like *fava*.

Turkey, the bridge between Europe and Asia, is one of the world’s leading chickpea and lentil producers and exporters. These pulses have deep roots in Turkey’s national cuisine, with Ottoman, Greek, Eastern European, Sephardic and of course Middle Eastern influences. Simple and nutritious dishes like rice with chickpeas, known as *nohutlu pilav*, as well as combinations of rice with lentils or beans, are staples in Turkish households, as are *mercimek corbasi* (lentil soup) and *tutmac*, to which noodles are added. Turkey’s cuisine also uses plenty of beans, surprisingly perhaps, given that they are far less produced than other pulses. Whether as an accompaniment to meat dishes or in salads, purées, stews or soups — many entirely vegetarian — beans hold a historic place of honour in Turkish cuisine.

The Bible mentions *adashim* or *lentils* up to six times (Genesis 25:24, 2 Samuel 17:28, Ezekiel 4:9), proving that it was a vital pulse in the Jewish diet.

Lentils can even be found growing wild in the southwest of Turkey and the north of Syria, which is where some palaeobotanists believe that they originated.

The mythical King Priam of Troy (in modern-day Turkey) had amongst his treasures many sacks of dried broad beans. He valued broad bean stews over any other pulse for stimulating his warrior spirit in the legendary Trojan War against the Greeks.

Ibn Abi Zayd’s Islamic text *Al-Risala* expressly condemns usury in the case of transactions of products such as *lentils*, beans, lupins, chickpeas, peas, broad beans and green beans.

*Falafel* or *felafel* is a deep-fried patty made from broad beans or dried chickpeas and is very common in Arab and Jewish cuisine (Arabic, *f alafi l* and Hebrew, * فلافل*). To make it, the pulses are not cooked, but rather are soaked in water to soften them, their skins removed and then they are blended. Next, vegetables, spices and aromatic herbs are added to make a thick mixture. This is shaped into rolls, the ends are slightly pointed, and then they are fried in olive oil.

*Karisik Tursu*, made from chickpeas with pickled and spiced vegetables on vine leaves, is a delicious traditional Turkish pickle dish which keeps for over five weeks.

Next-door to Turkey, Greece also shows a love for pulses, with winter dishes that are national institutions: Fasolada is a Lenten soup made with haricot beans and vegetables, with fried leek added at the end; Fakes is a lentil soup eaten as a main course after *mezze*.
03

CHICKPEAS, VALUE OF PRODUCTION
In these years, the production value has decreased by a third.

1990-2013
Average value 508,21 Million USD

04

PRODUCTION OF CHICKPEAS
Production levels have been halved.

2010-2014
648 THOUSAND TONNES

05

QUANTITY OF IMPORTS PER TYPE OF PULSE*
Lentils are this region’s most popular imports.

06

QUANTITY OF EXPORTS PER TYPE OF PULSE*
Exports in this region by comparison to its imports, are quite modest.

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
Chef Didem Senol working with her team in the kitchen of her restaurant, Lokanta Maya.
Lokanta Maya is one of Turkey’s most acclaimed restaurants. Its specialities are inspired by the country’s traditional dishes, though at the same time it has a reputation for being at the cutting edge of cuisine. The owner is Didem Senol, the chef who opened it in 2010 in the Karaköy district of Istanbul after a formative journey that took her from pursuing a degree in psychology at Koç University in the city on the Bosphorus straight to New York. Inspired to become a chef by the warmth of home-cooked stews, her travels to North America brought her to the French Culinary Institute in Manhattan’s SoHo. But before returning home, she gained valuable work experience at the Eleven Madison Park restaurant there.

Back in Istanbul, she worked at Un Teras, a fashionable urban restaurant specialising in classic ufak yemekler tasting menus (little dishes similar to mezze or tapas). But in 2006, she joined the Dionysos Hotel in Kumlubük, on Turkey’s southwest coast as their Head Chef. Her experience in the Mediterranean kitchen at this unique tourist destination led to her first...
For instance, at Lokanta Maya hummus is made from chickpeas (standard), with white beans (more rare), and even with the two pulses mixed together (quite unusual). Pulses are a constant feature in sauces, accompaniments, purées, soups and salads. They are used in starters and mains, from contemporary ragouts of beans, chickpeas and tripe with crushed lemon to haricot beans with smoked bream, red lentil and bulgur patties, lentil and broad bean soup to meat stewed with dried peas, white beans with pastrami and many more...

“I love cereals and pulses,” says Senol. “I think they’re extremely important for the sustainability of food resources, and as a protein supply for the population. We chefs should shed that professional ego that leads to a kind of classism in certain dishes, of using expensive and

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**RED LENTIL BURGERS**

1. Place lentils in a saucepan and cover with water. Simmer until thoroughly cooked (tender) and almost all of the water has been absorbed.

2. Add the bulgur, stirring and cooking for a few minutes.

3. Finely chop the onions and sauté in olive oil, adding the pepper paste.

4. Add onions into lentil mixture with lemon juice, pomegranate molasses, cumin, paprika and chopped herbs.

5. Form servings into patties and serve with lettuce.

*For paste: Take strips of red pepper and slow-cook with olive oil, chilli, salt, sugar and water.*

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book, *Kızınız Defne’yi oğlumuz İskorpit* (Flavours of the Aegean Sea), and inspired dishes that would become part of her signature repertoire at Lokanta Maya, such as her famous fish ragout with lentils.

Didem Senol identifies the concept of *originality* in the kitchen with *origin*; or in other words, with the aesthetic and dietary foundations that have been integral to Turkish cuisine since ancient times. Committed to eco-friendly, sustainable produce and the natural seasonal cycles, she uses dried pulses as a trademark of her establishments. This is a recognition both of the likely native origin of some of them, such as chickpeas (a number of researchers ascribe their early use to Turkey), and of the ever-presence of beans, lentils, broad beans and dried peas in many home-cooked or everyday urban recipes.

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WARM HUMMUS

SERVES 4

250 G DRY CHICKPEAS (SOAKED OVERNIGHT)

1. **Boil the chickpeas until they are soft.**
2. **Drain chickpeas, making sure to retain some of the water and place them in a food processor.**
3. **Add the tahini, crushed garlic, salt, lemon juice, cumin and seven tablespoons of the cooking liquid.**
4. **Mix in food processor, slowly pouring in the oil while blending.**
5. **Once the mixture is thoroughly blended and smooth, place it in a pan and warm up on low heat.**
6. **In a separate pan, melt butter with cayenne pepper and add pistachios.**
7. **To serve, place the warm hummus on a serving dish, season with spicy butter, and drizzle a little oil on top and decorate with pistachios.**

JUICE OF 1 LEMON

CAYENNE PEPPER

2 GARLIC CLOVES, CRUSHED

1 TEASPOON OF SEA SALT

CUMIN

50 G OF BUTTER

50 G OF PISTACHIOS

100 ML OF EXTRA VIRGIN OLIVE OIL

200 G TAHINI
unnecessary ingredients. We should give up passing fads that make us all the same and creative endeavours that deny what we have within our reach. We should give pulses credit and give our customers the opportunity to enjoy them, because they are a resource that we need to feed the planet well.”

In May 2012, Didem Senol opened Gram Pera, an innovative and popular restaurant-bakery concept only serving lunch. Located in the Pera neighbourhood, it offers casual dining that changes with the seasons, and pulses feature in many of its dishes. Her Gram Maslak, in Orjin, opened in 2014, and the Gram Kanyon, her most recent endeavour, replicate the experience. In her second book, Biraz Maya, Biraz Gram (Some Maya, Some Gram), published in 2014, she hints at the social responsibility that comes with culinary activity, her interest in sustainability and her unbridled devotion to local, seasonal ingredients.

Didem Senol sources produce from all over Turkey, and she is famous for forging friendships with her suppliers. She is particularly interested in working with small producers. “Local ingredients are what define a cuisine,” she often says. She visits Istanbul’s food markets every day. On Wednesdays, you will find her at Fatih Pazari, and on Saturdays she heads to the organic market in Feriköy. There, she buys lentils from Denizli, or the famous Bayramiç chickpeas, grown near the Marmara Sea.
Chef Didem Senol in the kitchen of her restaurant preparing different dishes with pulses: red lentil burgers, hummus and warm salad with pistachio purslane with fried chickpeas.
SOUTH AND SOUTH EAST ASIA

01 QUANTITIES PRODUCED BY TYPE OF PULSE
Chickpeas and beans are the highest produced crop in this region.

02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE
In these years, the value of pulses fell to a third of its 1990 levels.
American archaeologist and anthropologist Chester Gorman made many notable discoveries in Spirit Cave, Thailand, and his work was continued by his colleague, Wilhelm G. Solheim. Amongst these were finding the remains of domesticated plants, including pulses, dating back to before 9500 BC. Together with other evidence, these findings support theories of farming systems that pre-date even those of the Middle East. We know that many pulses, some of them extinct today, were domesticated species cultivated on the Indian subcontinent in the Vedic period (c. 1500 – c. 500 BCE). In all probability, these products reached Europe somehow, leading to the cultivation of beans (stemming from the Vigna genus rather than Phaseolus) well before the discovery of America. It’s thought they might have given rise to dishes such as Spanish fabada and Occitan cassoulet. Meanwhile, lentils (mentioned in the ancient Hindu text Vishnu Purana) and chickpeas, originally from western Asia,
acclimatised extraordinarily well and are now found especially in the north of the subcontinent in India, Pakistan and Myanmar (Asia’s leading producer of beans).

Southeast Asia is of course home to mung beans (green gram) and mungo beans (black gram), as well as soya beans, all contributing to a unique and varied range of pulse dishes. Countries such as the Philippines, under Spanish influence until the end of the 19th century, or Cambodia, once part of French Indochina, have kept alive certain imported culinary traditions using pulses, even though recipes have been adapted for beans more typical of the region. Elsewhere, since much of the region subscribes to a vegetarian diet and opts for food that is quick to prepare, it is common to find people choosing to eat pulses, raw.
As for the various cuisines scattered across the dozens of islands of the Indonesian archipelago, there are an almost infinite number of uses of dried pulses. The Sundanese in eastern Java use cooked beans such as in the popular dish of *karedok*, while the recipes of West Sulawesi feature pork and beans, with noticeable colonial roots.

In Pakistan, one of the region’s largest consumers and producers of chickpeas, we find that dried pulses are the most important source of vegetable protein. In descending order, their main crops include the all-powerful chickpea, mung beans, lentils and mungo beans (black gram), all of which are critical to the country’s food security. It should be noted that while many meat products fall under *halal* (ie not allowed under Islamic law), pulses suffer no

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**KOLKATA (INDIA)**
1. Street food sellers preparing dishes
2. Shop seller scooping some pulses
4. A woman prepares tea in a market for wholesale flowers.

**JAMMU (INDIA)**
3. Shopkeeper selling pulses in his shop.

**AHMEDABAD (INDIA)**
5. An elephant holds up traffic.
such prohibition. Further adding to the prominence of the pulse, the Thal Desert in Pakistani Punjab is an area that suffers from a high level of water stress. Despite being a place hostile to agriculture, it boasts a thriving chickpea crop; significant in that this highlights the power of pulses to grow even in extreme conditions. As for lentils, although there may be only under ten varieties, they are the object of future research interest in the country. Lentils are widely accepted in traditional Pakistani cuisine, as can be seen in specialities such as *toor daal*. Of course, an added benefit is that dried pulses are inexpensive. Although they may not normally form part of celebratory meals and banquets, when they do, it is usually to accompany some type of
meat dish. Pakistani cuisine also features a number of interesting bean dishes (from both the *Phaseolus* and *Vigna* genera), using tomato sauces with blends of *masala* spices.

India is the world’s second largest country by population and is the second largest producer of dried beans, with the greatest amount of land dedicated to their cultivation. It stands to reason, then, that as a country, it also rates highly in terms of overall consumption of dried pulses. India has the highest rate of vegetarianism in the world, with 30-40 percent of its population refusing to eat meat (the percentage is also quite high in neighbouring countries such as Bangladesh and Sri Lanka). Although meat has become increasingly popular in recent years, beans, lentils and chickpeas remain indispensable as a vital protein in the diets of hundreds of millions of inhabitants. This fact has, of course, created an immense culinary heritage orbiting the world of dried pulses.

In India there is a saying that means, “Your palate does not deserve the subtle delicacy of these lentils.” It recalls the story of a *nawab* or nobleman in Lucknow — modern-day Uttar Pradesh — who turned down the meal prepared for him by his *bawarchi* (chef) because he was too busy playing chess. Offended, the *bawarchi* emptied the contents of his saucepan into the remains of a wizened dead tree and quit the palace in disgust. A few days later, the dead wood sprouted new leaves. The nobleman, learning of the rejuvenating properties of the food he had dismissed, ordered them to be made again. Finding that the chef had vanished, he found himself rifling through the *bawarchi*’s belongings in an effort to find the recipe, known as *daal masoor*. But to his dismay, no sooner had he opened the recipe book, than the nobleman came face to face with the mocking phrase.

Small and round shapes are associated with prosperity in the Philippines. Lentils are therefore part of a traditional New Year’s Eve feast, to augur in the year to come. On the island of Luzon, superstition dictates that you carry lentils in your pocket so that you can be sure to have enough money to carry you through the New Year.

*Pindi chana* is a Pakistani speciality in which chickpeas are the main ingredient. Hot and spicy, the dish originates from the city of Rawalpindi, in the heart of Punjab, and has been enjoyed long before the partitioning of India and Pakistan. It is not surprising that it has become a very popular dish and is a source of common ground between the two countries.
**CHICKPEAS, VALUE OF PRODUCTION**
Value of production has doubled from 2002 to 2013.

**1990-2013**
*Average value*
1 815,73
Million USD

**PRODUCTION OF CHICKPEAS**
Production has tripled in 15 years and is set to further increase.

**QUANTITY OF IMPORTS PER TYPE OF PULSE***
The region is the largest importer of pulses, especially in dried peas.

**QUANTITY OF EXPORTS PER TYPE OF PULSE***
The region’s exports is modest compared with the volume of imports of pulses.

*Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
MUMBAI (INDIA)
Chef Sanjeev Kapoor showing some pulses, in the kitchen of his restaurant, Sanjeev Kapoor.
It is impossible to understand the world of dried pulses without India. It is the world’s largest producer of chickpeas, a leading producer of lentils and beans, and it has a massive population that treats pulses as an everyday staple food. Add to this its rich culinary past and present, as complex as the culture and climate of the states and territories making up the country.

This immense cultural heritage is evidenced in the superb recipes by leading Indian celebrity chef Sanjeev Kapoor, who owns restaurants in virtually all of India’s large cities as well as further afield: Saudi Arabia, Bangladesh, Bahrain, Qatar, UAE, Gabon, Jordan, Kuwait, Oman and even Canada. He has made Indian cuisine a household name through his popular *The Yellow Chilli* chain right up to his *haute cuisine* signature brands, *Sanjeev Kapoor* and *Khazana*. In a territory of billions, he has literally carved himself a place in history as one of Asia’s most influential chefs. He reaches
an audience of untold millions with his Indian cookery programme Khana Khazana, which has run for more than 23 years in over 2000 episodes and is broadcast to over 100 countries.

Multimedia savvy Sanjeev Kapoor is the only chef in the world with his own television channel, FoodFood. He has written 200 books translated into seven languages, has millions of followers on social media and his website hosts 15 000 recipes. He takes part in events and TV programmes with famous chefs throughout the world and the Indian government has officially recognised him as the country’s top chef. And as if that is not enough, he is a social entrepreneur – his companies are committed to gender equality and supporting people with autism. Through his unbridled capacity to communicate, this celebrity chef focuses on finding different ways for people to achieve a healthy and nutritious diet. And through this means, he seeks to prevent disease caused by malnutrition and unhealthy eating habits.

“Food should be simple. I believe in combining the best of our traditions, the freshest local ingredients, a bit of science and a dash of art. India is a land of daals (daals is simply the plural of the Sanskrit word daal referring to dried pulses with the outer hull stripped off, cooked
or mashed, or the dishes made with them) and ever since I was a boy, not a day has gone by when they have not been a part of my diet. My favourites are rājmā (red kidney beans in a spicy curry) and pindi chole (a chickpea curry). Mung and mungo beans (green and black gram) are also very important to my cooking,” says Kapoor.

The chef also notes that, given the size of the country, what and how much people eat varies from region to region. Thus, mung and mungo beans are eaten more in the north, lentils and chickpeas in the east, and pigeon peas in the south and west. This fosters a great diversity of dishes which varies region to region,
although the philosophy behind them rarely changes. One finds basic dishes from each of these areas, such as daal tadka (a curry made with pigeon peas), sambhar (a vegetable and pulse curry) and osaman daal (a spicy soup made with pigeon peas). Incredibly, even with all this choice, Kapoor says that Indian law dictates that products are clearly labelled either green or brown to distinguish vegetarian and non-vegetarian dishes.

“As a nation we love dried pulses and I am no exception,” says Kapoor, who goes on to say that they are “the best comfort food, especially when homemade.” Although he loves all pulses, he confesses a particular weakness for chickpeas. He recommends “Soaking them overnight and cooking them in a pressure cooker until they are so soft that they melt in your mouth.”

The popular chef has successfully used dried pulses in recipes across the board: from salads and soups, to breads, stews and desserts, and he professes that he loves experimenting with them since they “Add a unique character to any dish, as well as having the added benefit of their nutritional value.” Nowadays, Kapoor is too busy to casually stroll through the markets selecting his vegetables and pulses. But he recommends “A place close to my home, Parle market, in the Mumbai suburbs, where you can find any dried pulse you like.” He adds that “Sometimes people are fooled by size when it comes to pulses, thinking larger is better. But in reality, you can often get a lot more taste from smaller grains and beans, and if you have to choose between refined and unrefined pulses, you should always choose the latter.”
**Preparation**

1. Drain and grind the 3 dals with very little water to a fine paste. Transfer into a bowl.

2. Heat sufficient oil in a kadai. Whisk the batter well.

3. Add salt, green chilli paste and red chilli powder and whisk well. Drop small portions of the batter into hot oil and deep fry till golden.

4. Drain and soak in water for 10 minutes. Drain the bhalle and squeeze out extra water and arrange them on a serving platter.

**To Serve:**

5. Pour chilled yogurt over them and serve sprinkled with black salt, red chilli powder, cumin powder, date and tamarind chutney and coriander leaves.


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**Serves 4**

**Preparation Time:** 11-15 minutes

**Cook Time:** 16-20 minutes

**Serve:** 4

**Level of Cooking:** Medium

- **Split Green Gram Skinless (Dalili Moong Dal) Soaked:** 1/2 cup
- **Split Bengal Gram (Chana Dal) Soaked:** 2 tablespoons
- **Oil to Deep Fry:**
- **Red Chilli Powder:** 1/2 teaspoon
- **Black Salt (Kala Namak):** 1/2 teaspoon
- **Yogurt Whisked and Chilled:** 2 1/2 cups
- **Sweet Date and Tamarind Chutney:** 1/2 cup
- **Fresh Coriander Leaf Chopped:** 1/2 cup
- **Salt to Taste**
KARACHI (PAKISTÁN)
Chef Zubaida Tariq in her home.
Pakistan is the world’s third largest producer of chickpeas, and it is also a significant consumer of lentils. The words *chana* (chickpea) and *daal* (lentil) recur time and again in Pakistani cuisine, and yet agronomists are always hard at work, looking for ways to produce even bigger and better harvests of pulses.

The country has produced many highly respected chefs, but Zubaida Tariq (born in Hyderabad Deccan in 1945) deserves a special place amongst them. As a TV chef and authority on food, she has been followed faithfully by millions of viewers for over 20 years. Although born in India, in the region currently comprising the states of Andhra Pradesh, Karnataka and Maharashtra, she grew up in an affluent family of Urdu speakers that has produced a bevy of talented writers, artists and intellectuals. Her siblings are deceased novelist and playwright Fatima Surayya Bajia, poet Zehra Nigah, fashion designer Sughra Kazmi and the renowned television host and humourist Anwar Maqsood Hameedi. The first years of Zubaida’s life coincided with the end of British rule on the subcontinent, and she moved to Pakistan with her family in 1947, the year it gained independence following the Partition of India.
Known affectionately as Zubaida Apa (meaning “big sister” in Urdu), she came to cooking relatively late in life. However, when she did, she bloomed, to the point that she is now an undeniable reference point for cooking across the region. This is largely due to her numerous appearances on radio and television, such as the popular show *Handi*, on the food channel *Masala TV*. “When I married at 21, I couldn’t cook a single dish. My mother, who was good at many things, had taught us to push ourselves to achieve whatever it is we desired, but she didn’t teach me to cook. So once I decided I wanted to cook well, I took her advice and taught myself, by trial and error. Little by little, I realised that a lot of people liked what I cooked,” she says.

Zubaida Apa has captivated audiences with her personal style of cooking, based on traditional Pakistani cuisine and prepared with simple and honest ingredients, such as the country’s ever-present pulses. Her popular recipe books, including her take on dishes
Chef Zubaida Tariq showing her Award for cooking and talking with her guests at her residence before lunch. Selecting vegetables and serving up portions of pulses.
such as the national favourite *daal masala*, are highly influential in home cooking throughout Pakistan. Through her tried and true recipes, regional specialities have been transported around the world. “Dishes such as *chana chaat* and *murgh cholay* are popular all year round. *Lobias* (black-eyed peas) are excellent together with a light tamarind paste or a fresh tomato sauce, whether with a *chapati* (a type of wholewheat flatbread) or as a dressing. Lima beans can be eaten fried, Chinese style. *Masoor* (pink lentils) and mung beans (green gram) can be stewed with spices and then mixed with rice or curry. *Daal mash* is very popular, but it is more of a celebration food.” Amongst her favourite dishes are, of course, pulses. “At home I like to eat *keema* (a minced mutton curry with peas) with rice, *papri chaat* and *daal*,” she confesses. “In fact, daal is a food that should always be on the dining table: it is healthy, cheap, nutritional and tasty.”

This popular TV personality has won over the entire country with both her cooking and beauty tips, and she is convinced that “plant-based ingredients make a kitchen come alive.” Although she says that it is easy to get hold of pulses in Pakistan both in supermarkets and from street vendors, she prefers to go to the Empress Market in Karachi. “First-thing in the morning, when the traders are setting up their stalls and goods are only just arriving. In just one trip I know I can get all of the ingredients I need, at the best price and also the best quality.”

“Pakistani pulses have taken on their own personality in the food of the continent, but we need to have a wider range of vegetarian dishes and eat far less meat in our diet. We can do creative things with pulses, with all manner of ingredients. We can boil them, stew them, layer them, turn them into fritters, vegetable kebabs, and so much more.”
Punjmel Lentils

Braising

1 Onion (finely sliced)
6 dried, round red chilies
Garlic (4 cloves, finely chopped)
Cumin seeds (1 tsp)
Oil (1/4 cup)

- Soak all lentils for 2 hours
- Then boil with turmeric powder,
red chili powder and ginger / garlic paste
- Blend with hand blender when
lentils are tender

Add dried mango, green chilies, butter and salt

Add water, raw mango and ginger and let it cook
Fry tempering ingredients in a frying pan
Pour tempering over lentils and serve.

Gram lentils and white lentils
1 tbsp each

Butter
2 tbsp

Raw mango
1 small

Green chilies
4 pcs

Dried mango
6 pcs

Salt
to taste
07 THE FAR EAST AND THE PACIFIC

01 QUANTITY PRODUCED BY TYPE OF PULSE
Broad beans, dried peas and beans are the top pulses produced in this region.

02 VALUE OF PULSES OVER TOTAL AGRICULTURE
In these years, the value of pulses shrank to just one third overall.
In some countries of the Far East, dried pulses like chickpeas, lentils and beans of the genus *Phaseolus* are largely regarded as exotic, at least as far as everyday domestic use is concerned. This mainly stems from a subsistence farming tradition that since ancient times has revolved around wheat, rice, millet, sorghum and a single pulse, the soya bean\(^1\), whose prominence in the region has been immense in countries like China, Taiwan, South Korea and Japan. Another pulse, of the genus *Vigna*, the mung bean, is also prevalent, having spread throughout the region after originating in Asia.

But this does not mean that chickpeas, lentils or the *Phaseolus* beans are not produced or consumed in the Far East.

\(^1\) The FAO does not consider species used for oil extraction, like soya beans, to be a pulse.
BEIJING (CHINA)

1. Young girl leaving the market.
2. and 5. A selection of pulses at the market.
3. Chinese chef She Zengtai chatting to a neighbour.
4. Shopper buying ginger at the market.
6. and 7. Different scenes at the market.
and Oceania. China is one of the world’s leading bean producers, while Australia is a major lentil and chickpea grower. The varied weather conditions of this vast region — even with violent phenomena like monsoons — and its immense farms have enabled competitive pulse cultivation.

South Korea, Japan and Taiwan consume large quantities of dried mung beans and black gram (also of the genus *Vigna*), used in a wealth of traditional dishes. Some of these may have been brought about by the influence of western cultures that have left their mark since the early contact between civilisations, through the long colonial period, to the recent era of globalisation.

However, there are also many varieties of dried pulses that are eaten locally in certain countries or regions, such as the *Vigna umbellata*, or ricebean, originating in New Guinea and consumed in southern China and Nepal. Others are only used for specific recipes such as certain desserts, like the sweet *adzuki* bean originating in East Asia (originally cultivated in the Himalayas), which is widely used in Japan and China to make red bean paste.

Nepalese cuisine, meanwhile, has the traditional *kūtī* soup, eaten during the *Gun Punhi* festival and made from no fewer than nine types of pulse; some dried and others fresh, including chickpeas, black-eyed peas,
black gram and mung beans. This mountainous country is also a major producer of lentils, which are often used in *daal bhat* along with rice, one of the most widespread culinary combinations across much of Asia. In China’s Uighur regions, Mongolia and eastern Russia, pulses are not commonly consumed, but occasionally appear in certain dishes, such as the Russian salad vinaigrette, with white beans, or in Mongolian *kashk*, which is sometimes made with mung beans.

In Oceania, and particularly across the many Pacific Islands, there is no great tradition of eating pulses, though nowadays they are being consumed more and more. Australia and New Zealand have both moved toward becoming major producers and their people are responding to the influence of global gastronomic trends.

As for China, the world’s most populous country and the third largest by land mass, pulse growing has always centred around the soybean, a product that was rare in the West until the second half of the twentieth century, despite having arrived in Europe in the seventeenth century. The Chinese were early Neolithic farmers, developing highly advanced agriculture systems in later periods, as mentioned in the records of the Emperor Sheng Nung.

Chinese cuisine is as complex and as vast as the country’s territory. Today, global trends toward fusion food and the cosmopolitan nature of cities like Hong Kong, Macau and Shanghai, have led to a cultural shift towards pulses in the region. China’s major cities have started to adopt a variety of international culinary habits and trends making it easy to find pulses, such as those seen on the menus in increasingly popular Spanish and Mexican restaurants. Despite China’s large-scale production of lentils and beans of the genus *Phaseolus*, these crops are primarily grown for export and it is less easy to find them in street markets as one might expect.

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**CURIOSITIES**

- In Japan, during the Bunsei and Ansei eras, silver coins were minted in the shape of beans or peanuts.

- One of the most famous scenes in the popular video game *Super Mario Bros*, created by Shigeru Miyamoto for the Japanese company Nintendo, is the Beanbean Kingdom, inhabited by beings in the form of beans.

- The Shanghai Institute of Endocrinology, Jiaotong University, the Ruijin Hospital and other Chinese institutions are researching the weight-loss properties of chickpeas. Their studies are inspired by the use of this pulse in traditional Uighur medicine from Xinjiang, an autonomous region of northwest China.

- Bottled dried pea soups are very popular in China, one of the world’s leading producers of this dry pulse.

- Pulses are used in the East to make desserts. Eight-treasure rice pudding is a Chinese dessert made from peanuts and dried red beans.

- The Australian filmmaker Trevor Graham produced the documentary *Make Hummus Not War*, in which he delves into the hotly debated provenance of *hummus*. He puts forward the idea that it could even be used to resolve the conflicts between the Lebanese, Israelis and Palestinians, who have disputed the origin of this dish before international courts.

- In New Zealand, organic pulse farming proliferates, in particular lentils, dried chickpeas, mung beans and adzuki beans, establishing the country as a major food supplier in Oceania for the future.
BROAD BEAN, VALUE OF PRODUCTION
Production value has fluctuated greatly over the years.

1990-2013
Average value
705,71 Million USD

PRODUCTION OF BROAD BEAN
Fluctuating in the early 1990s, production levels have stabilised in recent years.

2010-2014
1 562 THOUSAND TONNES

QUANTITY OF IMPORTS PER TYPE OF PULSE*
Dried peas are most imported type of pulse in this region.

QUANTITY OF EXPORTS PER TYPE OF PULSE*
This region’s highest exports are different varieties of beans.

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
BEIJING (CHINA)
The renowned Chinese chef She Zhengtai showing off a bean roulade dish in his Beijing home.
The culinary history of the family of the honourable chef She Zengtai, born in Beijing in 1955, dates back to 1404, during the Ming Dynasty reign of the Yongle Emperor. Twenty-two generations have passed on their knowledge, uninterrupted. “Many recipes that I have inherited from my ancestors,” he explains, “are over a century old, and some are several hundred years old. The dishes, of course, have been perfected through exploration and the creativity of my ancestors.” The fact that this culinary heritage has survived through time is in itself a credit to chef She. After all, preservation of the family trade is part of the complex and ancient history of Chinese cuisine, a tradition spanning over 5 000 years with huge global influence. Chef She has been appointed by the Chinese Government to be the custodian of this intangible cultural heritage.

She, now retired from the everyday activity of professional kitchens, but a fixture on cookery programmes, is a living encyclopaedia of Chinese cuisine. He is able to reel off the uses and customs of each region of this

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Chef She at work as his wife looks on.
contents of dishes. Experience has shown us that replacing a certain amount of animal produce with dried pulses is the best way to solve the two-way, paradoxical problem of global malnutrition and over-nutrition.”

Despite the predominance of soybeans in China, She explains that the volume of production of other pulses is quite high in the country. Once, when involved in an exhibition on culinary history organised by his country’s government, many of the traditional ingredients shown were dried pulses. This provoked surprise among the younger generation of chefs yet received praise from the Chinese culinary community. “They are now iconic products that we Chinese chefs can take abroad with pride, as a manifestation of what future global cuisine must be. Excluding dried pulses from immense country one by one, describing the reasons for each technique, habit or ingredient. Throughout his career, he has prepared countless banquets for political and business leaders, but he has never forgotten his bond with the countryside or his calling to serve the people. Before learning the ins and outs of the profession from his father, She Chonglu, a grand master of Hui cuisine, he worked on the Xiaojialin farm unit as an engine driver.

“As society develops and quality of life improves,” says chef She, “people begin to attach more importance to health. As chefs, we must keep up with the times by creating healthy, nutritious dishes and sharing them with society. We have to adjust our cooking methods, like using high temperatures, which can destroy many nutrients, but also the

**BEAN ROLADE**

1. **Knead the cooked glutinous rice flour until it makes a long roll.**
2. **Cover a chopping block with the cooked soy flour. Then, using a rolling pin, roll out the cylinder into rectangular pieces roughly 4 mm thick.**
3. **Spread the red bean paste evenly over the pieces.**
4. **Starting from the end, roll these pieces together gradually until you have a long cylinder three centimeters in diameter.**
5. **Cut into pieces and stack them onto a plate.**

This roulade has a smooth, delicate texture and a sweet flavor and was another favorite of the royals during the Qing Dynasty.
Chef She making bean roulade.
our diet is a serious mistake and it leads to a terrible nutritional imbalance. Dried pulses help us reduce fat levels and strengthen our immune system. They contain protein, amino acids, carbohydrates, B vitamins, carotene and inorganic salts like calcium, phosphorous, iron, potassium and magnesium, but they have a low sodium content,” says the chef She, who, in addition to being a renowned chef is an expert in traditional Chinese medicine food.

She Zengtai is an innovator who has reconciled the rituals of Hui and halal cuisine, investigating their dietary taboos while finding creative new ways to achieve ethnic culinary perfection. “I like using soybeans, peas, red adzuki beans and mung beans. All of these pulses are very versatile. I use them in 20% of my cooking, married with meat and vegetables, as well as tofu. To cook them, I like to use a pressure cooker, but then, depending on the dish, other methods can be used,” he explains.

As for buying pulses in his area, She explains, “I get pulses in Beijing from places like the great Niujie Muslim Market, where there is a strong affinity with these products, sometimes at the Lotte Mart supermarket, and also in the Dongcheng district. You won’t find much difference in the price of the products, but the important thing is to make sure of the quality. Every time I go, I meticulously select the pulses and do a lot of comparing before buying. A recipe should always be tackled using the right ingredients.”
Yellow Split Pea Pudding

**Ingredients:**

- 500g Dry Peas
- 200g White Sugar

1. **Wash the peas and place them into a pot.**
   **Add four times as much water and bring to a boil.**

2. **Reduce the heat and cook until the peas split.**

3. **Drain using a colander.**

4. **Crush the peas to a mash and add the white sugar,**
   **mixing well until the sugar has dissolved.**

5. **Pour the mixture into a pudding form tray.**

The pudding’s yellow color and the rich, pleasing flavor of the peas made this dish a well-known “royal favorite” of the Qing Dynasty.
01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2010 - 2013)
Broad beans is North Africa’s top crop.

2010-2014

02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE
In these years, the value of pulses has fluctuated, while on a decreasing trend. In 2013, the value of pulses fell to a third of their value of 1994.
There are practically as many pulses in North Africa as there are sand dunes in the Sahara, but it is the chickpea that stands alone. In all probability they arrived in the region in ancient times with the Phoenicians who brought with them numerous vegetable species.

From the legendary city of Tyre, the Phoenicians founded the Punic State, with Carthage as its capital in what is now Tunisia. From there, the chickpea migrated to Western Europe via the Iberian Peninsula, before spreading across most of the Mediterranean during various military campaigns. While the Islamic conquest of the Maghreb brought still other pulses to the region, it reaffirmed the chickpea’s predominance as a food staple.

Coming from a hostile geographical context in which inhabitants have always had to outsmart the desert, the dry chickpea has steadfastly remained a reliable food source for the region’s nomadic tribes. Thanks in part to its unquestionable nutritional value and long shelf life,
the diplomatic pulse helped eliminate boundaries by sharing a culinary tradition across the continent – from the Western Sahara to Alexandria.

In this region, Berber cuisine offers highly nutritious dishes such as chakhchoukha, a mixture of rougag bread and marqa, a lamb, vegetable and chickpea stew. While these recipes find their roots in Algerian cuisine, they take on variations throughout the area, such as lablabi, a Tunisian soup.

It is virtually impossible to pinpoint the geographical place of birth of the domesticated pulses of North Africa – most likely it occurred in various places at once. What we can be certain about is that along the Nile Valley, long before the pharaohs, in Neolithic times, the soil fertilised with lime from the river played a decisive role in leading to the emergence of one of the most fascinating civilisations in human history.

In Egyptian hieroglyphics, a symbol resembling three dots is a distinct reference to seeds, quite possibly pulses, which were the main source of protein for these inhabitants of ancient Egypt. They subsisted primarily on chickpeas, broad beans and lentils. In the Dra’ Abu el-Naga’ necropolis near Thebes, funeral offerings in the form of lentil cakes have been found, and it is widely

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**MARRAKESH (MOROCCO)**

accepted that lentils were one of the most highly prized pulses. Frescoes from the Nineteenth Dynasty of Egypt show a servant cooking these pulses, while the city of Phacus was known as the “City of lentils”.

Algeria, Egypt, Libya, Morocco and Tunisia are countries where pulses play a central role in their cuisines (with Sudan, perhaps, the only regional exception). In addition to a variety of chickpea dishes such as hummus and falafel, lentils are also common, in salads, purées and stews. Significant, too, is the nutritional value they provide people during the month of Ramadan, when eating is forbidden during daylight hours.

In Morocco, pulses are especially prominent in dishes such as tagine, where chickpeas almost always feature. In the traditional harira soup, in addition to chickpeas, dry peas and lentils add further substance, particularly during the winter months. Pulses also feature in the hearty broad bean purée, bissara, a mainstay of communities in the Atlas Mountains. In Moroccan markets, street vendors sell cornets of steamed chickpeas dusted with cumin, in the same way that chips are sold at fairs in Western countries. Another culinary feature are kiosks where cooks prepare kalinti, or karane, using chickpea flour, a speciality of Sephardic origin. It is served in rolls or paper bags as a fortifying snack for workers or school children. Also for Moroccans, lentils are standard fare in stews and salads prepared in households and for important celebrations alike.

Throughout North Africa, the traditional first meal for a mother after giving birth is Trid, a dish rich in energy-boosting carbohydrates. It is made of lentils, chickpeas and beans, and considered the best tonic for a woman who from that point on will need to breastfeed her baby.

Cumin is a common spice in all North African cuisine and is virtually indispensable in all pulse dishes, not just for its flavour. It also helps to prevent gases from forming in the gut, owing to the fact that it is a carminative.

Carminatives are found in a wide range of herbs and spices including caraway, coriander, dill, epazote, liquorice, fennel, ginger, lemon grass, mint, nutmeg, basil, marjoram, oregano, aniseed and rosemary. Not only do they neutralise bacteria in the gut that creates gases, they also offer a terrific range of great flavourings.

While seasoning and spices are employed to silence (so to speak) some of the effects of pulses, some professional chefs in North Africa also try to ensure they are easily digestible by way of preparation. Starting with discarding the water they’re soaked in, but also the water they are first boiled in (both of these contain substances that gas-causing bacteria feed on). Then, they put pulses in new water before the real task of creating the meal commences.

During the holy month of Ramadan, fasting is often broken with harira or chorba, a soup made with chickpeas, lentils, beans and peas.
**03**

**BROAD BEANS. VALUE OF PRODUCTION**
Production value has remained fairly constant.

**1990-2013**

**Average value**

211,92

Million USD

**04**

**PRODUCTION OF BROAD BEANS**
In general, production has decreased in these years.

**2010-2014**

528

THOUSAND TONNES

**05**

**QUANTITY OF IMPORTS PER TYPE OF PULSE***
Imports are 8 times more than North Africa’s exports of pulses.

**06**

**QUANTITY OF EXPORTS PER TYPE OF PULSE***
North Africa exports a very modest quantity of pulses.

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*Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
Selecting legumes at the Mellah market.
The Swiss Vieux-Bois restaurant, part of the École Hotelière Genève, is located opposite the United Nations headquarters in Geneva. Due to its proximity, culinary integrity and cosmopolitan service, with students from over 40 countries, its dining rooms host a mainly international clientele. It must be one of the most efficient “hands-on” hospitality schools in Europe, with restaurants and gardens open to the public. Its versatile students, studying cookery, hospitality and restaurant management are trained to become both chefs and managers.

Mohamed Fedal came to the Vieux-Bois for three years at the age of 18, (1985-1988). He remained in Europe where a culinary revolution was underway in the early 1990s before gaining experience in the kitchens of famous North American hotels. Ultimately, homesickness brought him back to his native Marrakesh. Mohamed Fedal, known in professional circles as Moha, now 30, purchased the home of French fashion designer Pierre Balmain, located in Dar El Bacha, his childhood neighbourhood, near the Medina of Marrakesh. And in 1999, he opened the Dar Moha Restaurant (seating capacity 140), where he returned...
Moha’s enthusiasm for pulses is not purely a romantic notion. Some six kilometres from the centre of Marrakesh, he runs the Riad Le Bled, a rural hotel on a three-hectare estate. There, he provides accommodation and dining areas for banquets and celebrations. But first and foremost, the orchards, vegetable gardens and the pulses that are grown and dried there are used to supply his restaurants with the beloved chickpeas, green beans, broad beans, peas and lentils that feature heavily in his dishes.

Moha Fedal is now leading a revolution in Moroccan cuisine, a challenge that he tackles by sharing to the fundamentals of traditional Moroccan cuisine. While adding some innovative touches to his dishes, he set out to earn Intangible Cultural Heritage status for his country’s culinary traditions.

It is in the flavours harking back to his childhood where Moha’s taste for pulses lies. Along with couscous, argan oil and the indispensable ras el hanout, that combines up to 40 spices, they form the basis of his inspiration as a chef. It’s a way of cooking learned at his mother’s side, a master chef in a family of painters and artisans. “As a boy, I learned that pulses are the jewels of Maghreb cuisine. Because of their variety and colour – dried beans and peas, chickpeas or lentils; round, flat or long; green, red, yellow or black – they nourish and crown a tagine like diamonds, rubies or emeralds.”
Chef Fedal preparing a dish with pulses in the kitchen of his restaurant, Bled.
his vision and know-how, and providing practical training in the kitchen to future professionals, including schoolchildren; educating them on food and culinary self-sufficiency. As a professional and teacher, he asks himself a question: “If choosing forces you to give something up, why choose between tradition and modernity when you can combine the two trends harmoniously?”

In his quest for a lighter cuisine, he refines quantities and adds nuances. Under his guiding hand, revamped hariras, hummus and pulse salads take on a new form without succumbing to products or condiments from outside Morocco’s traditional culinary culture. Doing so would globalise them and strip them of their identity. At the same time and ironically, his pulse recipes have achieved an even broader appeal.

Moha Fedal is a winner of the Vermeil Medal of the Arts, Sciences and Letters, an accolade recognising understanding and dialogue between cultures and societies. He is the author of cookbooks, such as The Flavour of Morocco, Moha’s Kitchen, and others, all of them published in France where he is highly regarded as a top chef. He is often Morocco’s official representative at international culinary exhibitions, a Moroccan Master Chef judge and, every Sunday at 10 am, he participates in the radio programme Family Kitchen.

In 2015, Moha brought his carefully orchestrated updates of traditional Moroccan culture to the World’s Fair in Milan. There, he presented Moroccan cuisine at a universal stage that focused on soil, nutrition and the right to a healthy and adequate diet. Naturally, pulses played a starring role.
Harira Soup

Preparation:

1. Soak the dry broad beans, chickpeas and lentils for eight hours.

2. Drain and place them in a saucepan with grated onion, pepper, ginger, turmeric, cinnamon, coriander, celery and oil.

3. Cover with half the water and bring to a boil.

4. Reduce heat and simmer for 15 minutes.

5. Add the chopped tomatoes and tomato concentrate and then add enough water to cover well and cook for another 30 minutes.

6. Mix flour with about 2 cups of water to make a smooth mixture without lumps. Pour slowly into the pot, stirring continuously while heating for another 20 minutes.

7. Season with salt, leave to stand and serve over rice or noodles.
QUANTITIES PRODUCED BY TYPE OF PULSE

This region boasts with the greatest variety and quantity of pulses.

VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE

Pulses had a bumper crop in this region in 2012 but fell to its usual production levels in 2013.
Just as Africa is considered the umbilical of modern humans, palaeobotanists believe\(^1\) it is also where, more than 60 million years ago, the evolutionary jump took place that gave rise to pulses – though quite different to the pulses we know and love today.

The term *Bantu* (which originally meant “person” or “human”) refers to a significant number of ethnic groups originating in Western Africa, and whose migration throughout history is vital for us to understand modern day Africa. Incipient knowledge of farming, metalwork and advanced skills with ceramics gave Bantu people a territorial advantage, and as they travelled to southern and eastern Africa they took their knowledge with them. They were able to grow crops on land that seemed barren, and this achievement would form the foundation of many of the important states in the region over time: the Nri and Kaabu.

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\(^1\) Other theories suggest that this process happened in the Americas, in the semi-arid land corridors of the Tethys Ocean, during the Paleogene period. None of these have been proven conclusively, but most agree that pulses began in the Cenozoic Era.
kings, the empires of Oyo, Benin, Bamana and Ashanti, the Sokoto Caliphate and Nok culture.

Cereals, tubers and certain pulses were the base of their diet, and led to one of the great themes of Sub-Saharan cuisine: nutritional purées, often used as sauces or sides for meat dishes, or even as a simple dressing. Later, the colonisation of the Americas created and strengthened an important link with western Africa, with products of every kind travelling in both directions. In the process, sometimes something new would be created, and sometimes it simply helped develop what was already there. This is the case with black-eyed peas travelling to the Americas; most likely first farmed in western Africa. While contact with colonial powers resulted in certain pulse dishes being adopted in Africa. This is the case of feijoada, a popular dish in African countries that were under Portuguese influence, such as Angola and Cabo Verde. The latter is an island nation, and a type of bean stew called cachupa is its national dish.

There is no doubt that in the countries of central and western Africa, pulses are eclipsed by other food groups both in terms of production and consumption. Rice, millet, maize, cassava, sweet potatoes and yams are all common in their diet, as well as meat, from both livestock and wild animals. Nonetheless, it is also true that some dried pulses are frequently found in the region’s cuisine, often as
DAKAR (SENEGAL)

Western and central Africa
and more, with dried pulses. Although both crop agriculture and livestock rearing in Africa first came to being in the Sahel (the semi-arid region bordering the Sahara), a number of events have influenced Mali’s move toward pulses: climate change, desertification and the lack of easy access to water have, over the centuries, created real problems for Mali in terms of farming, and this has had lasting effects up to the present day. The country’s diversification of its agriculture has proven effective in reducing rates of malnutrition. With the growing consumption of dried pulses, and with them the micronutrients they provide, the future is looking much brighter for Mali.

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**Curiosities**

- **Senegal cooking includes black-eyed peas, lentil stews, and ndambé**, a sandwich made from stewed beans in a very spicy tomato sauce – served up for breakfast.

- **Nigeria is Africa’s largest country by population and one of the world’s largest producers of pulses.** Nigerian cuisine features a number of dishes that include beans, such as the pudding moimoi (called tubaani in Ghana) and acaraje fritters, both made with black-eyed peas.

- **Pinto beans are consumed widely in Ghana and Chad, especially in the south.** Both countries share many dishes, with Ghana using beans in a variety of ways, such as redred stew, a type of homemade baked bean dish made with black-eyed peas, adzuki beans, palm oil and spices.

- **Lesotho, Niger and Sierra Leone all produce and consume significant quantities of dried peas.** Pigeon peas and Bambara beans are also grown and eaten in Burkina Faso, Chad, Ghana, Niger, Nigeria, Senegal, Togo and Mali. In fact, the name Bambara comes from Mali’s Bambara language.

- **Certain autochthonous dried pulses such as Macrotyloma geocarpum (also called ground beans and similar to peanuts) are important in the diet of Benin.**

- **Among the worldclass chefs hailing from Western and Central Africa are Cyril Agbachom, who works at Quilox in Lagos (Nigeria) and Gbubemi ‘Fregz’ Fregene, who trained at France’s Le Cordon Bleu and is now a specialist in providing quality catering services.**

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**Dakar (Senegal)**

Harcot beans imported from France in the Grand Dakar market.
**03**

**BEANS. VALUE OF PRODUCTION**
The value of this crop has nearly quadrupled in the time span shown.

**1990-2013**
**Average value**
1,726.62 Million USD

**04**

**PRODUCTION OF BEANS**
Increasing steadily over the years and fluctuating wildly from 2012 to 2014.

**2010-2014**
6,396 Thousand Tonnes

**05**

**QUANTITY OF IMPORTS PER TYPE OF PULSE**
Beans and peas are the main products imported.

**06**

**QUANTITY OF EXPORTS PER TYPE OF PULSE**
The volume of export is marginally greater than imports.

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* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
A wide variety of pulses are grown in this region.

Although less than its 1993 levels, the value of pulses has not changed since 2004.
In the cultural history of the inhabitants of the savannah and plateau ecosystems, agriculture was a latecomer: hunter-gatherers were the norm in these regions up until some 2000 years ago. Then the model changed, probably due to the arrival of Bantu tribes from the centre of the continent. The agricultural knowledge and command of forging that these newcomers brought with them revolutionised the region.

Some palaeobotanical theories place the origin of the Fabaceae family squarely in Africa. They even argue that these plants are the most common spontaneously generating species in the continent’s jungles and dry forests. There is no doubt that the first human inhabitants of East Africa made use of these pulses as food early on and began to store them, even if their domestication proved impracticable for nomadic tribes. But pulses helped them ensure an adequate diet with low dependence on animal protein. This is evidenced by basic traditional recipes of high nutritional value that have been passed down from generation to generation, such as the Kenyan Kikuyu’s irio, a purée of cereals and pulses.

Today, beans of all kinds feature heavily in the regional cuisines...
of East Africa, both of the *Phaseolus* genus, including black-eyed peas or *adzuki* beans, and other families such as pigeon peas. Not to ignore of course pulses native to the continent like Bambara beans (originally from West Africa) and *lablab* (*njahi* in the Kikuyu language). In Rwanda, beans are usually cooked in large pots and stored a number of ways while in Burundi, pinto beans are a daily staple, often combined with potatoes. Kenyans like to eat them with yucca and in Uganda they prefer them with sesame paste, *sim-sim*, but also in stews like in their famous *kikomando* recipe.

The region’s tribal cuisines combine some unique ingredients with pulses. The Masai, for instance, use cow’s milk or blood, and some tribes even use insects such as termites or *mopane* worms, sautéed with lima beans and *sadza* flour, undoubtedly a good source of protein. Another important region is the Horn of Africa, an area that has experienced serious challenges when it comes to food, and where carbohydrates from the omnipresent *ugali* porridge are the perfect complement to dry pulses. The *shahan ful* recipe, a similar dish to the Egyptian *ful medames*, calls for combining them with vitamin-rich raw vegetables and lemon.

South African cuisine has also contributed their fair share of specialities using pulses to African cuisine, such as the hard-to-pronounce Bantu dish, *umngqusho*. The *xhosa* variation was Nelson KARATU (TANZANIA).
strong agricultural industries, such as Kenya and Uganda. There, broad beans are an ever-present accompaniment in traditional homemade cooking — along with ugali, rice and the vegetable known as mchicha, a type of amaranth. They are always prepared simply with just a touch of salt, pepper and, at most, a little tomato. The cooked beans are eaten with minimal garnish and accompanied by animal protein, be it fish or meat.

For the African continent, with its infinite nature reserves made up of savannahs, forests, mountains and beaches, its countless protected animal species and over 120 tribes and scattered ethnic groups, their abundant production of pulses serve not only as an excellent source of food and nutrition for the population, but also as an efficient way of preserving this unique ecosystem.

Mandela’s favourite recipe. Influenced by European and Asian cuisine, South Africa boasts a tradition of pulse dishes such as the popular sheep’s trotters or pork and beans.

Madagascan cuisine, influenced by the busy trade with America starting in the sixteenth century and with Asia long before then, combines a variety of preparations and products, from pork and Bambara bean stews to pots of lima beans with potatoes. Of course, in a country with a Portuguese colonial history like Mozambique, feijoada features. And travelling further east, to the Seychelles archipelago in the Indian Ocean, lentil dishes are commonplace.

Tanzania is distinguished as one of the world’s leading producers of dry beans. In fact it’s Africa’s top producer, well over and above other countries in the region with.Notes:

On Kenya’s central highlands, a dairy industry has emerged thanks to fodder enriched with pulses. Indirectly, these plants are improving the nutritional quality of the milk and in turn, the quality of life of local subsistence farmers and their animals.

Trials introducing native South African pulse varieties to parts of Australia have been successful, contributing to the rise in pulse consumption in Oceania.

Githeri, a Kenyan dish of sweetcorn and pulses is always associated with the “mother.” It is one of the healthiest specialities of southeast African cuisine and remains a staple among the Kikuyu and Meru ethnic groups. Throughout the 20th century it is a mainstay of school menus in versions that also include tubers. It is equally popular among young people and diners of high-end restaurants.

Southern Africa grows some native pulse varieties that are rare in other regions. These include: the small-grained Vigna vexillata or the Tylosema esculentum, which inhabitants of the Kalahari call the marama bean, sometimes used as a rich source of a milk similar to soya; the Guibourtia coleosperma or Bubinga tree, with edible seeds that serve medical purposes; or the Canavalia ensifolia and the Bauhinia petersiana, pulses that can also act as a coffee substitute.

The development of agrotourism in the north of Tanzania, near the volcanic regions of the Ngorongoro, is fuelling an interest in unusual pulses among foodies interested in ethnic cuisine.
**BEANS. VALUE OF PRODUCTION**
The value of production has remained steady.

1990-2013

*Average value 211,92
Million USD*

**BEAN PRODUCTION**
Production levels saw a sharp drop in 2012 and recovered in recent years.

2010-2014

528
THOUSAND TONNES

**QUANTITY OF IMPORTS PER TYPE OF PULSE**
The region imports 20% less than its exports.

**QUANTITY OF EXPORTS PER TYPE OF PULSE**
Beans, followed by dried peas and chickpeas are top exports.

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.
At the foot of the Ngorongoro Crater in northern Tanzania are nestled the Tanganyika Wilderness Camps. The camps are set within large tracts of land earmarked for long term environmental protection and sustainable development. The aim is to promote green tourism and authentic experiences in an age-old atmosphere. Visitors are accommodated in amongst East Africa’s rich wildlife and landscape of rare beauty, as well as in areas still inhabited by legendary tribes. Safari is offered as a bloodless cultural activity. The Ngorongoro Farm House works in partnership with local communities to contribute to their prosperity. Their conviction is that it will only be possible to preserve Africa’s wildlife if the local population is involved and benefits from it; hence all of the staff are Africans.
Veronica Jackson is an example of this dynamic duo of personal and community involvement to promote age-old traditions of Tanzania while creating an exclusive and vibrant hospitality industry. Of Masai origin and the only woman of five siblings, the industrious Veronica has been head chef for the past fifteen years at the Kitela Lodge. She oversees the hotel and camp kitchens that are part of the Tanganyika Wilderness Camps initiative.

Born in 1970, Jackson studied in one of the country’s handful of cookery schools, the Forozan, in Dar es Salaam. Situated on the Indian Ocean, Dar es Salaam, Tanzania’s largest city, was the country’s capital until 1996, but during the colonial era it found itself the capital of German East Africa and under the British protectorate of Tanganyika, until its peaceful independence and unification of Tanganyika and Zanzibar.

Jackson is both expert and enthusiast of the region’s traditional cuisine. Her position notwithstanding, she has no qualms about experimenting with new dishes or adapting them to her customer’s tastes. After her initial training, she apprenticed for just one year, before running kitchens in various establishments for 30 more. Her roles included a stint as head chef at the Masek Tented Camp, a destination in the Ngorongoro Conservation Area in the southern Serengeti and as a pioneer of Africa’s eco-friendly camp tourism.

In addition to her role as executive chef, Veronica is involved in the management and public relations of the resort, where as the chief of culinary matters she is indispensable. At the Tanganyika Wilderness Camps, daily meals feature gourmet experiences with ethnic recipes adapted to meet conventional tastes of foreign
East and southern Africa

Chef Veronica Jackson in her garden patch and in the kitchen of the restaurant in Kitela Lodge.
visitors or incorporate contemporary western and eastern culinary trends.

The produce is ultra-local and used in daily meals at the camps and their restaurants or for feasts during excursions. Here, the tasty, ancestral tradition of pulses features as part of a local, healthy and balanced diet. “Pulses are the staple food of the people of Tanzania,” Veronica explains, “and demand is growing in the country, so we must make sure that they are produced. We have to expand and facilitate growing to guarantee supply and distribution so that the wealth of pulse varieties is available to everyone.”

In fact, in addition to the supplies from markets in Arusha, Karatu and Mto wa Mbu (well worth a visit to discover the region’s unique products), the Tanganyika Wilderness Camps’ own shambas (kitchen gardens) produce conventional and native pulses that illustrate the diversity of the ethnic cuisine of the Masai people and other remote tribes that survive to this day, like the hunter-gatherers of the Hadzabe Datoga and Barabaig.

Veronica Jackson is responsible for the growing cycles of the gardens that surround the camps, like Kitela, where the nearby communities are permitted to plant pulses in the coffee plantations for their own use. The many local varieties grown there enrich the culinary experience with pulses, whose delicious and exotic names whet the appetite: kunde kunde, mbaazi, maharagwe soya, maharagwe mabichi, dengu, choroko, nyayo maharagwe, ngwara mea…
Maharagwe

*BEANS

SERVES 4

HOW TO PREPARE:

1) Boil kidney beans in a pot of water until soft. Drain keeping the water aside.

2) Place onion and garlic in another pot and fry in oil until tender.

3) Add the minced meat and cook for 10 minutes.

4) Add the tomato, carrot and coriander and lightly fry for 5 minutes.

5) Add the cooking water from the beans and boil for 2 minutes.

6) Remove from heat, mix with the kidney beans and serve.

INGREDIENTES:

- 1 cup of kidney beans
- 1/2 kg of minced meat
- 2 tomatoes, chopped
- Chopped coriander
- 2 carrots chopped
- 1 onion chopped
- 2 garlic cloves crushed
- Oil for frying
Photographers

Alan Keohane (UK) currently lives in Marrakech and has authored books on his adopted homeland, “Berbers of Morocco” and “Bedouin, Nomads of the Desert”. His work has appeared in numerous publications including the Assouline book on the Mammounia and Dorling Kindersley’s Top 10 Guide to Marrakech.

benjaminrasmussenphoto.com

Jane Hahn (South Korea-USA) is an award-winning photographer based in West Africa. She has been recognised by the British Journal of Photography with the Single Image Prize in 2015, by the Open Society Institute of West Africa for her Ebola coverage and with an Award of Excellence by Pictures of the Year International in 2016.

www.janehahn.com

Adam Wiseman (UK-Mexico-USA) is the recipient of Mexico’s prestigious SNCA/FONCA fellowship (2012-2015). His most recent assignments have been featured in National Geographic, The Guardian, The Sunday Telegraph, The Wall Street Journal, ESPN, Monocle and Wallpaper magazines.

samuelaranda.net

Asif Hassan (Pakistan) works as a photographer and videographer for Agence France Press (AFP) in Pakistan, covering national news and special features. In January 2015, during his coverage of anti Charlie Hebdo protests by Islamist youths in Karachi, he was shot and wounded.

giuseppebizzarri.com

Paul Joynson Hicks (UK) moved to Africa in 1993. He has lived and worked in Uganda and Tanzania and has published four photography books. His passion for Africa led him to set up the charities: www.wonder-workshop.org, www.goatraces.com, www.mollynetwork.org for which he was awarded an MBE.
Atul Loke (India) was the recipient of Japan’s Young Portfolio Award (2002) and a European photography fellowship in 2002, working with renowned photographers from National Geographic Magazine and Magnum Agency. He covers major national and social issues and is currently working on a personal book project in Mumbai. panos.co.uk/stories/1-5-1424-1918-ALK/Atul-Loke

Luis Cepeda Baranda (Spain) journalist, food critic. He is a contributor to the leisure magazine supplement of Spanish newspaper El País, and Spanish collaborator to Elle-Gourmet, Sobremesa, Esquire, Tapas, Expansion and Vogue in Mexico, where he was director of Ediciones Deusto. He is the author of fiction, biographies and gastronomic treatises and as a foodie, founder of Gastronomicom News and owner of the blog, Eating Office. www.comerdeoficio.com

Saúl Cepeda Lezcano (Spain) writer, lawyer, political scientist and food journalist specializing in international cuisines and food anthropology. Award-winning author of fiction and nonfiction and collaborator to Desktop and Rolling Stone magazines. saulweb.com

Justin Jin (UK-China) shoots epic projects for Geo, captures front-page reporting for the New York Times, and has held a major solo exhibition at Amsterdam’s Rijksmuseum. International accolades include the Magnum Award, Pictures of the Year International (POYi), and World Press Photo Masterclass. justinjin.com

Nik Neves (Germany–Brazil) was selected as one of the 10 best illustrators of Latin America by AIAP and chosen for Society of Illustrators, Communication Arts, and American Illustration annuals. A contributor to Descobrir Catalunya and National Geographic Traveller, he illustrated books Illustration Now! 5, Mind the Map. nikneves.com

Romualdo Faura (Spain) professor of corporate identity, editorial design and design of pictographs in various universities. In 2007 he won the Spanish national award, Injuve Design and Young Creation, for Graphic Design. He has won several international design awards for his work.