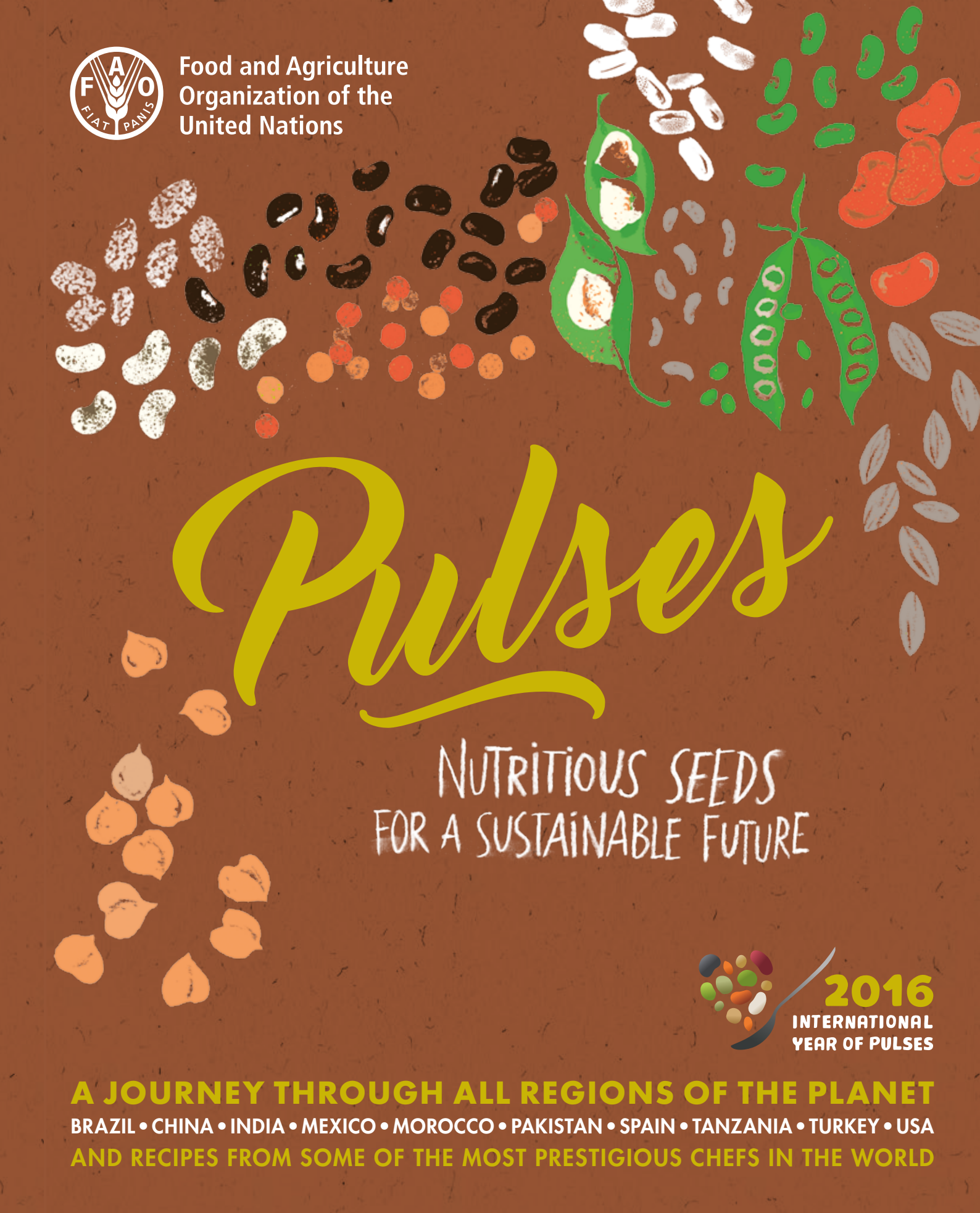
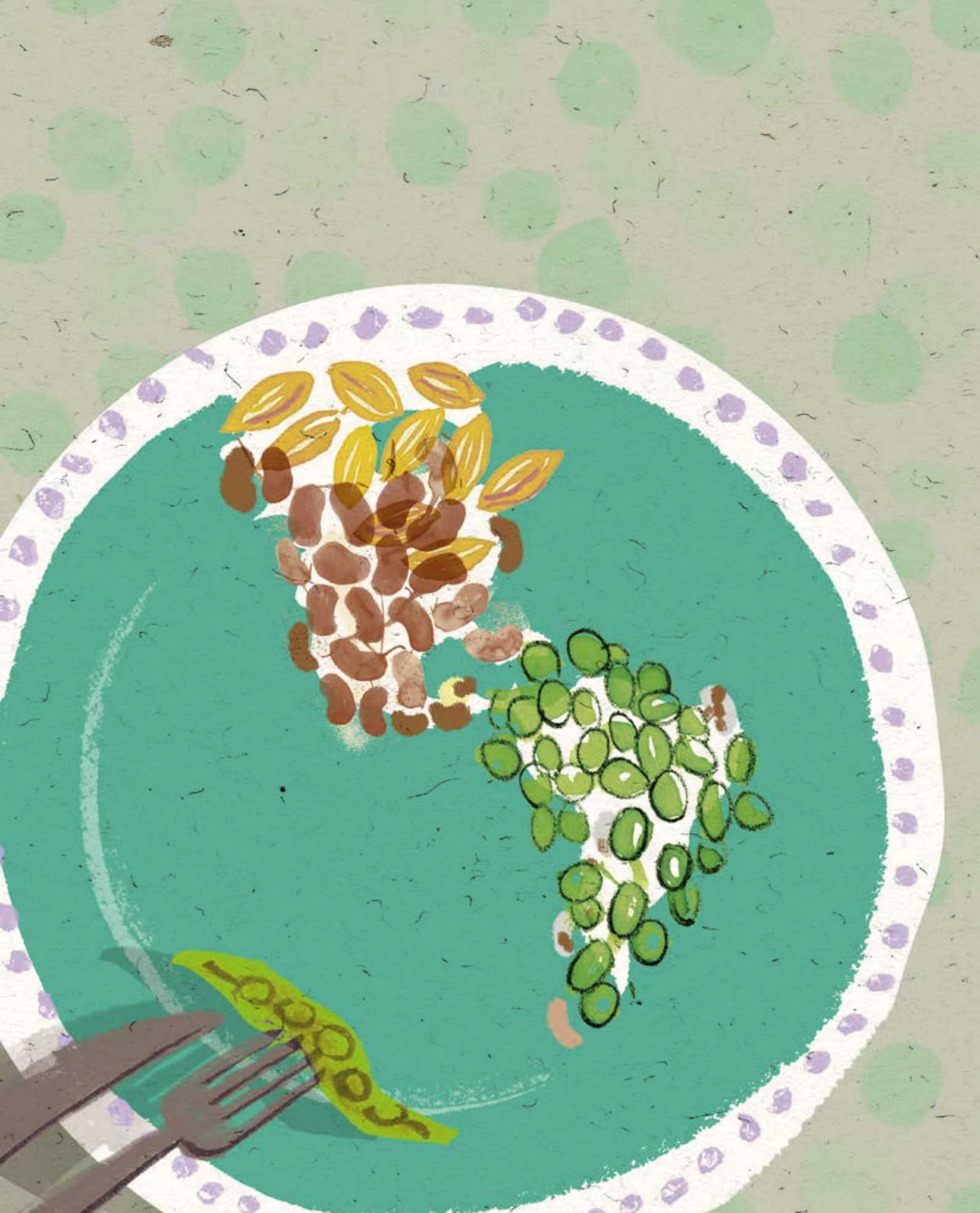
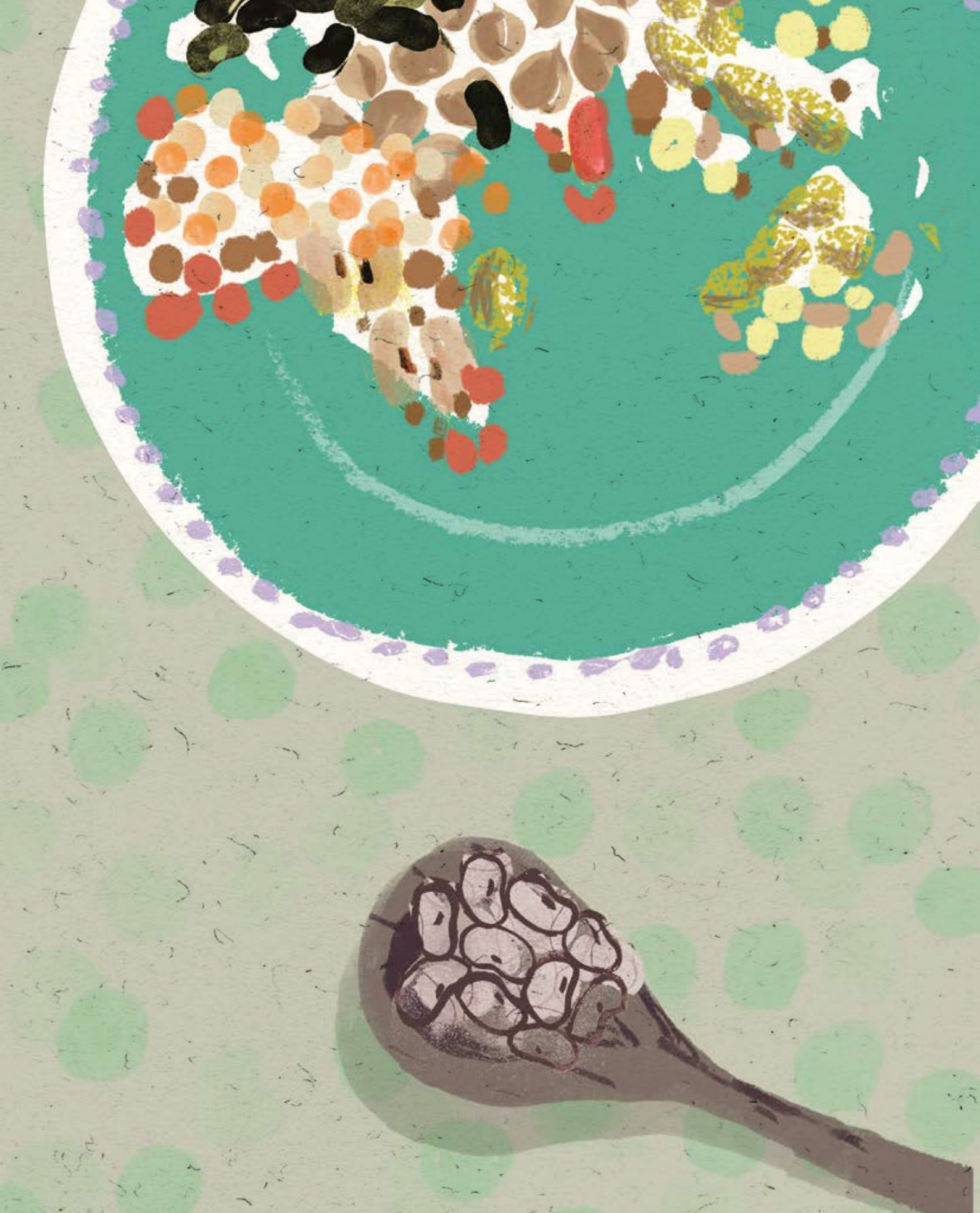

Food and Agriculture
Organization of the
United Nations
Pulses
NUTRITIOUS SEEDS
FOR A SUSTAINABLE FUTURE
2016
INTERNATIONAL
YEAR OF PULSES
A JOURNEY THROUGH ALL REGIONS OF THE PLANET
BRAZIL • CHINA • INDIA • MEXICO • MOROCCO • PAKISTAN • SPAIN • TANZANIA • TURKEY • USA
AND RECIPES FROM SOME OF THE MOST PRESTIGIOUS CHEFS IN THE WORLD





The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the **Food and Agriculture Organization of the United Nations (FAO)** concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of FAO.

ISBN 978-92-109463-1

© FAO, 2016

FAO encourages the use, reproduction and dissemination of material in this information product. Except where otherwise indicated, material may be copied, downloaded and printed for private study, research and teaching purposes, or for use in non-commercial products or services, provided that appropriate acknowledgement of FAO as the source and copyright holder is given and that FAO's endorsement of users' views, products or services is not implied in any way.

All requests for translation and adaptation rights, and for resale and other commercial use rights should be addressed to **copyright@fao.org**

FAO information products are available on the FAO website (**www.fao.org/publications**) and can be purchased through **publications-sales@fao.org**.

# Pulses

NUTRITIOUS SEEDS
FOR A SUSTAINABLE FUTURE

# Acknowledgements

## *Pulses*
### *Nutritious seeds for a sustainable future*

HAS BEEN PREPARED BY THE FAO OFFICE OF CORPORATE COMMUNICATIONS

This publication was led by **Pedro Javaloyes**, and coordinated by **Síle O'Broin.** Art Director **Rubén Bruque** was supported by **Fabrizio Puzzilli** and **Monica Umena** for the English version, and **Isla Gráfica** for the French version. **Sherri Dougherty** produced the videos and photo shoots. **Santi Mayor Farguell** produced the video version of the book.

**Síle O'Broin** and **Lisa R. Tucci** edited the English version of the publication, while **Hamza Bahri** reviewed the French version. The Spanish version was reviewed by **María Salas.** **Eleonora Boni** coordinated the translation into French, Spanish, English, Arabic, Chinese and Russian.

We would like to thank a number of FAO experts for their contributions to this publication: **Teodardo Calles** for providing information on the agricultural aspects of pulses, **U. Ruth Charrondiere, Fernanda Grande, Maria Xipsiti,** and **Chiara Deligia** for the nutritional and health information on pulses and their compositional data, **Salar Tayyib** and his Food Balance Sheets team of the Statistics Division particularly, **Luigi Castaldi** and **Rachele Brivio**, for providing statistical data and information on pulses throughout the publication.

The team of writers, photographers, illustrator and infographer are mentioned at the end of this publication.

The contents of this publication
can be found on the FAO webpage
International Year of Pulses
www.fao.org/pulses-2016

# TABLE OF CONTENTS

1234


## PART 1
WHAT ARE PULSES?

Presence and power
**PAGE 12**

A brief guide
**PAGE 13**

Varieties
**PAGE 14**

## PART 2
CARING FOR AND COOKING YOUR PULSES

Keep in mind
**PAGE 28**

Condiments
**PAGE 29**

Cooking
**PAGE 30**

Instruments
**PAGE 31**

## PART 3
THE POWER OF PULSES

Nutrition
**PAGE 35**

Health
**PAGE 38**

Climate change
**PAGE 39**

Biodiversity
**PAGE 40**

Food security
**PAGE 41**

## PART 4
HOW ARE PULSES GROWN?

Growing your own garden patch
**PAGE 44**

Cultivation around the World
**PAGE 46**

Pulses in the world
**PAGE 50**

Major producers
**PAGE 52**

Major exporters and importers
**PAGE 54**

# TABLE OF CONTENTS

5

## PART 5

## A WORLD OF PULSES


1. NORTH AMERICA
*Photographs by* ***Benjamin Rasmussen***
**PAGE 58**

2. CENTRAL AMERICA AND THE CARIBBEAN
*Photographs by* ***Adam Wiseman***
**PAGE 70**

3. SOUTH AMERICA
*Photographs by* ***Giuseppe Bizzarri***
**PAGE 82**

4. EUROPE
*Photographs by* ***Samuel Aranda***
**PAGE 94**

5. EASTERN EUROPE AND WESTERN ASIA
*Photographs by* ***Samuel Aranda***
**PAGE 110**

6. SOUTH AND SOUTH EAST ASIA
*Photographs by* ***Atul Loke*** *(India) and* ***Asif Hassan*** *(Pakistan)*
**PAGE 122**

7. FAR EAST AND THE PACIFIC
*Photographs by* ***Justin Jin***
**PAGE 144**

8. NORTH AFRICA
*Photographs by* ***Alan Keohane***
**PAGE 156**

9. CENTRAL AND WESTERN AFRICA
*Photographs by* ***Jane Hahn***
**PAGE 168**

10. EASTERN AND SOUTHERN AFRICA
*Photographs by* ***Paul Joynson-Hicks***
**PAGE 176**

1

2

6

7

3

4

5

8

9

10

# TABLE OF CONTENTS

## PART 5
A WORLD OF PULSES

5 Recipes

### 1. UNITED STATES
**CHEF RON PICKARSKI**
PAGE 64
- Mediterranean *Humma-Nusha*.
- *Picadillo* sauce.
- Cannellini Bean Polenta loaf.

### 2. MEXICO
**CHEF MUÑOZ ZURITA**
PAGE 76
- Refried beans.
- *Takgswahajun*.
- *Frijol Colado*.

### 3. BRAZIL
**CHEF HELENA RIZZO**
PAGE 88
- *Farofa Campeira*.
- Homemade black bean soup.
- Cowpeas with clams and mushrooms.

### 4. SPAIN
**CHEF ABRAHAM GARCÍA**
PAGE 100
- *"A feira"* Octopus.
- Chickpea and Cod stew.
- Mussels on a bed of *verdina* beans.
- Scallops, lentils and *sobrassada*.

### 5. TURKEY
**CHEF DIDEM SENOL**
PAGE 116
- Red lentils burgers.
- Warm hummus.
- Broad bean dip.

### 6. INDIA
**CHEF SANJEEV KAPOOR**
PAGE 132
- *Quabooli*.
- *Madgame*.
- *Teen Dal Ke Dali Bhalle*.

### 7. PAKISTAN
**CHEF ZUBAIDA TARIQ**
PAGE 138
- Spinach with white lentils.
- Yellow lentils with soya.
- Punjmel lentils.

### 8. CHINA
**CHEF SHE ZENGTAI**
PAGE 150
- Bean roulade.
- Lily broad beans.
- Yellow split pea pudding.

### 9. MOROCCO
**CHEF MOHAMED FEDAL**
PAGE 162
- *Korain*.
- Hummus.
- *Harira*.

### 10. TANZANIA
**CHEF VERONICA JACKSON**
PAGE 182
- *Maharagwe ya nazi* (Beans in coconut milk).
- *Makande* (Sweetcorn and bean soup).
- *Maharagwe*.

# Chefs

1

2

3

4

5

6

7

8

9

10

# FOREWORD

# Nutritious seeds for a sustainable future

## 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.

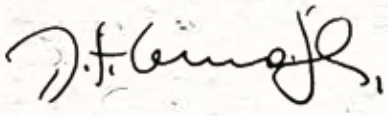
FAO is disseminating information on pulses in both print and multimedia, as well as hosting events at national, regional and global levels. Through these regional dialogues and global awareness campaigns, we aim to stimulate discussion and information exchange among civil society, farmers, the private 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
1

# What are pulses?

# Presence and power of 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 uncompromising 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.

# A brief guide to Pulses

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.

Dried 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.

# Varieties of pulses

THE FOLLOWING LIST ILLUSTRATES THE MAJOR GROUPS

## DRIED BEANS

Borlotti beans

Black beans

Adzuki beans

Cannellini beans

Red kidney beans

Haricot beans

Flageolet beans

Pinto beans

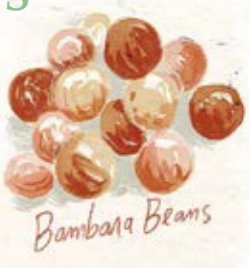
Mung beans

Urd beans
(BLACK GRAM)

Tepary beans

## LUPINES

## BAMBARA BEANS




## BROAD BEANS

## LENTILS

Red lentils

Yellow lentils

Green
or brown lentils

Puy lentils

Umbrian lentils

## DRIED PEAS

## DRIED PIGEON PEAS

## CHICKPEAS

Bambai chickpeas

Desi chickpeas

Kabuli chickpeas

## VETCHES

## DRIED COWPEAS

## WINGED BEANS

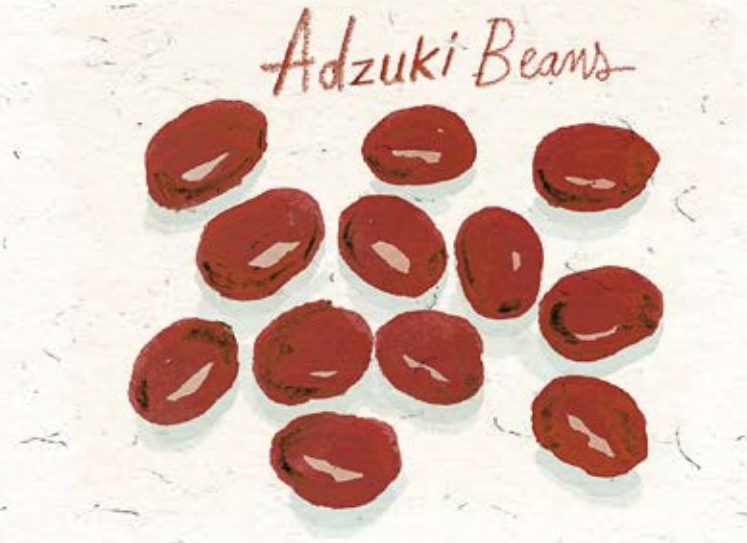
## SWORD BEANS

# Varieties of pulses

## DRIED 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.

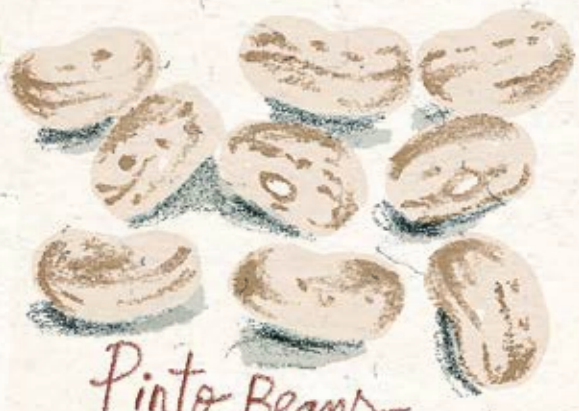
## Flageolet Beans

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

# Varieties of pulses



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.

# Varieties of pulses

**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.

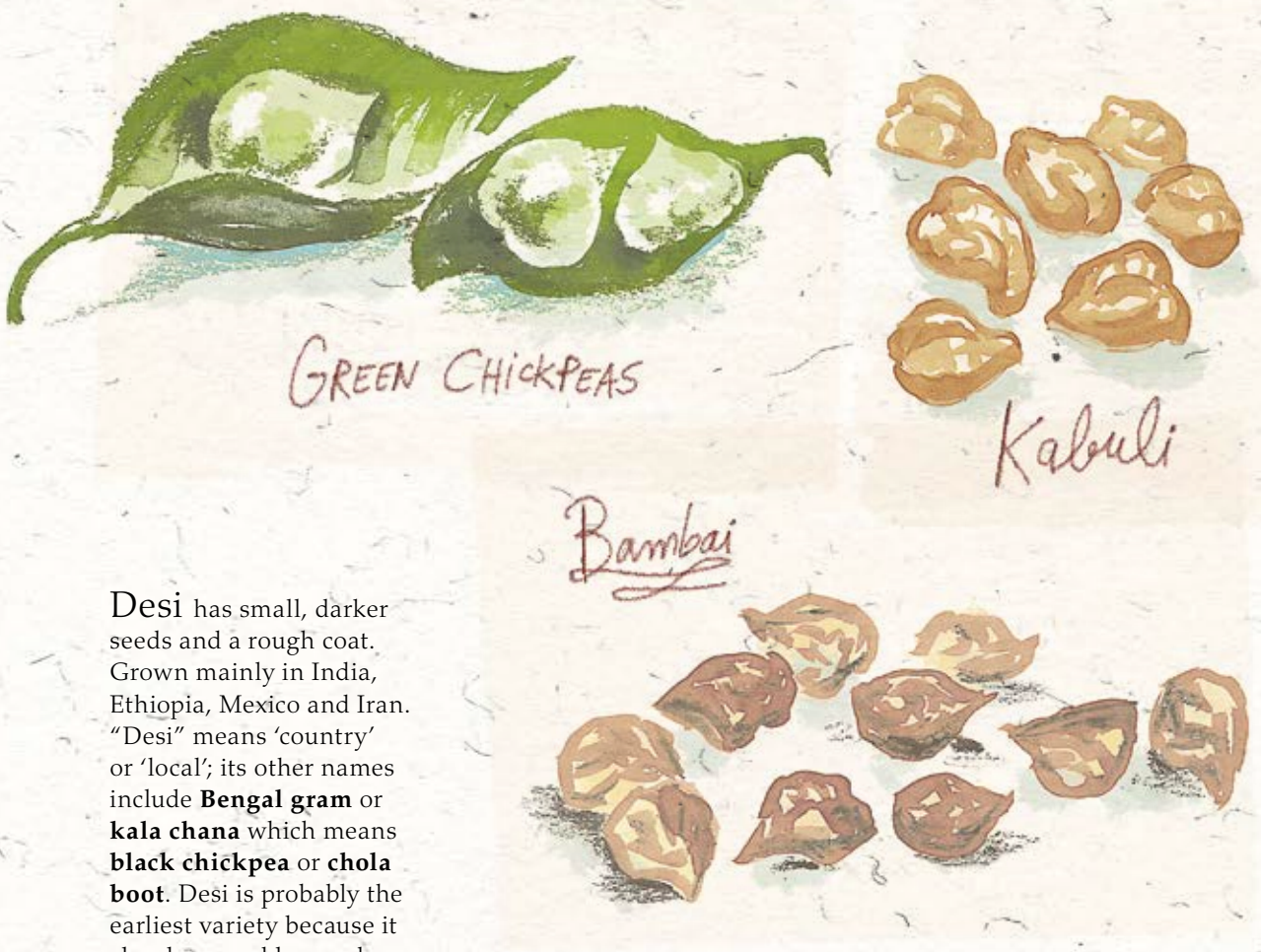
## DRIED BROAD BEANS

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 *Fabaria,* 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.

# Varieties of pulses

## 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.

## 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*.

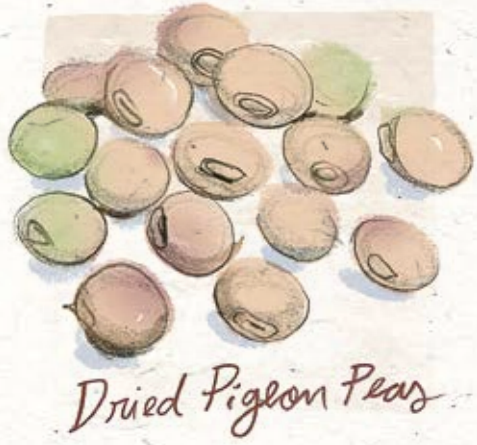
## Green and Brown Lentils

Unlike the red and yellow varieties, these common disc-shaped lentils, known as **continental lentils**. Although they turn soft, they still retain 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!

# 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.

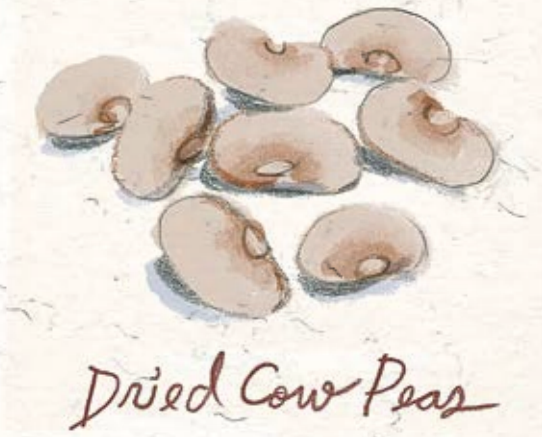
Unlike lentils, **peas** are soft when young and require drying. Peas are tiny spherical seeds and are available either whole or split. Usually boiled or steamed, like split lentils, **split peas** disintegrate into a thick puree, making them perfect for *daals*, pureés, casseroles and soups. Peas have 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 nutritiously 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 wtih 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

## 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 spoonsful 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

# Condiments

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.

# 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.

## 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 uniformally.

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 cooling. 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.

## Instruments

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, moreso 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.

Part 3

The power of pulses

# FIVE WAYS PULSES IMPACT OUR WORLD

## 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.

# 1. Nutrition

## 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.

## 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

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.

# Nutritional

| NAME | SCIENTIFIC NAME | ENERGY (kcal) kJ | PROTEIN (g) | FAT (g) | FIBRE (g) |
|---|---|---|---|---|---|
| ***Bambara* groundnuts** | *Vigna subterranea* | (326) 1360 | 20.1 | 5.9 | 28.9 |
| **Broad beans** | *Vicia faba* | (300) 1260 | 26.1 | 1.8 | 26.3 |
| **Cowpeas** | *Vigna unguiculata* | (316) 1330 | 21.2 | 1.3 | 15.3 |
| **Lentils** | *Lens culinaris* | (336) 1420 | 25.4 | 1.8 | 10.7 |
| **Pigeon peas** | *Cajanus cajan* | (300) 1260 | 18.4 | 1.5 | 20.2 |
| ***Adzuki* beans** | *Vigna angularis* | (310) 1310 | 19.9 | 0.53 | 12.7 |
| **Pintos beans** | *Phaseolus vulgaris* | (316) 1330 | 21.4 | 1.23 | 15.5 |
| **Black beans** | *Phaseolus vulgaris* | (288) 1210 | 21.3 | 1.2 | 21.8 |
| **White beans** | *Phaseolus vulgaris* | (315) 1330 | 22.3 | 1.5 | 15.3 |
| ***Mung* beans** | *Vigna radiata* | (324) 1370 | 23.9 | 1.15 | 16.3 |
| **Red kidney beans** | *Phaseolus vulgaris* | (314) 1330 | 22.5 | 1.06 | 15.2 |
| **Chickpeas** | *Cicer arietinum* | (340) 1430) | 21.2 | 5.4 | 12.4 |
| **Kabuli chickpeas** | *Cicer arietinum* | (370) 1560 | 21.5 | 6.05 | 12.6 |
| **Desi chickpea** | *Cicer arietinum* | (366) 1540 | 20.8 | 5.1 | 13.7 |
| **Urd beans (black gram)** | *Vigna mungo* | (315) 1330 | 25.2 | 1.64 | 18.3 |
| **Lupin beans** | *Lupinus albus* | (356) 1490 | 36.17 | 9.74 | 18.9 |
| **Cannellini beans** | *Phaseolus vulgaris* | (323) 1360 | 23.4 | 1.6 | 17.6 |
| **Borlotti beans** | *Phaseolus vulgaris* | (324) 1370 | 20.2 | 2 | 17.3 |
| **Peas** | *Pisum sativum* | (308) 1290 | 18.44 | 1.4 | 26 |

**ALL PULSES HAVE 0 CHOLESTEROL**

# Values

| CARBOHYDRATE (g) | FE (mg) Iron | MG (mg) Magnesium | P (mg) Phosphorous | K (mg) Potassium | ZN (mg) Zinc | CU (mg) Copper | VIT B9/FOLATE (µg/100g) |
|---|---|---|---|---|---|---|---|
| 28.9 | 3.3 | 199 | 275 | 1190 | 3.38 | 0.89 | n.a. |
| 31.7 | 6.1 | 191 | 506 | 1080 | 3.1 | 0.82 | 423 |
| 47.2 | 7.3 | 187 | 387 | 1210 | 4.61 | 0.68 | 417 |
| 49.3 | 7 | 103 | 391 | 855 | 3.9 | 0.74 | 295 |
| 43.2 | 4.7 | 183 | 269 | 1390 | 1.96 | 1.02 | 456 |
| 50.2 | 4.98 | 127 | 381 | 1254 | 5.04 | 1.09 | 622 |
| 47.1 | 5.07 | 176 | 411 | 1393 | 2.28 | 0.893 | 525 |
| 37 | 6.5 | 188 | 471 | 1416 | 2.9 | 0.83 | 444 |
| 45.5 | 5.49 | 175 | 407 | 1185 | 3.65 | 0.834 | 364 |
| 46.3 | 6.74 | 189 | 367 | 1246 | 2.68 | 0.941 | 625 |
| 46.1 | 6.69 | 138 | 406 | 1359 | 2.79 | 0.699 | 394 |
| 45.5 | 5.4 | 146 | 342 | 1116 | 3.2 | 0.67 | 557 |
| 51 | 5.4 | 157 | 319 | 1110 | 2.41 | n.a. | 236 |
| 52.3 | 5.1 | 154 | 294 | 1100 | 2.36 | n.a. | 251 |
| 40.7 | 7.57 | 267 | 379 | 983 | 3.35 | 0.981 | 216 |
| 21.47 | 4.36 | 198 | 440 | 1013 | 4.75 | 1.02 | 355 |
| 44.9 | 8.8 | 170 | 460 | 1411 | 3.6 | 0.7 | n.a. |
| 47.7 | 9 | 163 | 464 | 1478 | 2.9 | 0.7 | n.a. |
| 42.4 | 3.5 | 116 | 295 | 1010 | 2.39 | n.a. | 138 |

SOURCES: West African Food Composition Table (FAO, 2012); USDA SR 28 (2015); Tabela brasileira de composição de alimentos / NEPA – UNICAMP (2011); CREA website (accessed 2016) Tabelle di composizione degli alimenti; unpublished data

**VALUES FOR RAW AND DRIED PULSES AS PER 100 G EDIBLE PORTION ON FRESH WEIGHT BASIS. AVAILABLE CARBOHYDRATES. DIETARY FIBRE**

# 2. Health

## Pulses–power pod

**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

### AID WEIGHT MANAGEMENT

Naturally **low-fat** and **high in fibre** and with a **low glycemic index**, pulses are ideal for everyone. Their high fibre content increases satiety and helps stabilize blood sugar and insulin levels thereby reducing spikes after eating and improving insulin resistance. In short, pulses are an ideal food for diabetics and for weight management.

### REDUCE HEART DISEASE

High in **soluble fibre**, which is known for its positive impact on lowering LDL cholesterol, a recognized risk factor for coronary heart disease, pulses may reduce the risks of coronary heart disease.

### IMPROVE NUTRITION

Pulses are **good sources of vitamins** such as **folate**, which is shown to reduce the risk of neural tube defects (NTDs) like spina bifida in newborn babies.

### PREVENT IRON DEFICIENCY

**High in iron content**, pulses are a potent food for preventing iron deficiency anaemia in women and children when combined with foods containing vitamin C to improve iron absorption.

### ADD PROTEIN QUALITY

**Protein quality** matters, particularly for growth and development. The protein quality of vegetarian diets and plant-based diets is significantly improved when pulses are consumed together with grains.

### RELIEVE FOOD ALLERGIES

Because they're **gluten-free**, pulses are a desirable food for anyone with gluten allergy or suffering from Celiac disease.

### PROTECT HEALTH

Pulses are rich in **bioactive compounds** such as *phytochemicals* and *antioxidants* that may contain anti-cancer properties. Phytoestrogens may also prevent cognitive decline, reduce menopausal symptoms and thereby promote bone health.

# 3. Climate change

neural tube defects (NTDs) in embryos and newborns so it is especially important for pregnant women to include folate-rich foods like red lentils in their diets.

## Bloating

While pulses are good for your health, typically, people shy away from them and reach for other foods. Pulses can cause bloating, flatulence, and unless soaked for hours, can take a very long time to cook. This is because they contain anti-nutrients that can cause some bodily discomfort during digestion. The good news is that these issues can easily be side-stepped by soaking pulses overnight and introducing them gradually into the diet. But nowadays, agricultural scientists are bringing new breeds of pulses to market containing fewer anti-nutrients and requiring less soaking time, if any, as well.

An added advantage to nutrition and health via pulse consumption is that pulses are a source of protein that does not contain residues of hormones or antibiotics typically used in livestock production (and consumed unwittingly in beef and milk, for example) that can undermine one's health.

**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 $CO_2$. 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 $CO_2$ 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.

**Pulses are hardier than most other crops, withstanding severe weather like droughts and floods, where other crops fail; thus acting as an unflinching David to the Goliath ravages of climate change.**

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.

# 4. Biodiversity

**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 bio-chemical 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.

**Pulses should be an integral part of any agro-ecosystem due to the immense positive effects they have on the ecosystem**

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.

# 5. Food security

**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.

## *Pulses: for small farmers, good things come in small seedlings*

- Farmers can eat and sell the pulses they produce, improving household food security and economic stability
- Pulses can be used to feed livestock
- Pulses have a long shelf life when stored properly, allowing flexibility to counter extreme weather conditions
- Pulses are an excellent cover crop, used as green manure for sustainable farming or as forage for livestock
- Farming costs are reduced due to reduced necessity for mineral fertilizers
- Beans typically fetch four times the price at market than some cereals

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
1

How are pulses grown?

# Growing your garden patch of pulses

## ANCIENT TRADITIONAL FLAVOURS

**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 first 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 air-tight 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.

# Cultivation around the world

**Dozens 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.

## Nine Benefits of Pulses

### Boast a long shelf life

When stored in airtight containers, pulses can last months, even years, without spoiling. For subsistence farmers, this could mean the difference between life or death should they suffer a bad harvest or natural disaster (like floods) that wipes out their entire harvest.

### Keep you healthy

FAO recommends that people eat at least 400g of fruit and vegetables per day, which includes pulses and other legumes. This is equivalent to eating about 25g of dietary fibre per day. As pulses are high in dietary fibre, they can help prevent obesity, reduce blood pressure and reduce the risk of heart disease.

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.

## 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.

## Help other 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.

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

## 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

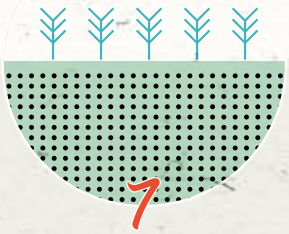
## 'Clean' crops: do not emit greenhouse gases

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.

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.



## 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.

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.

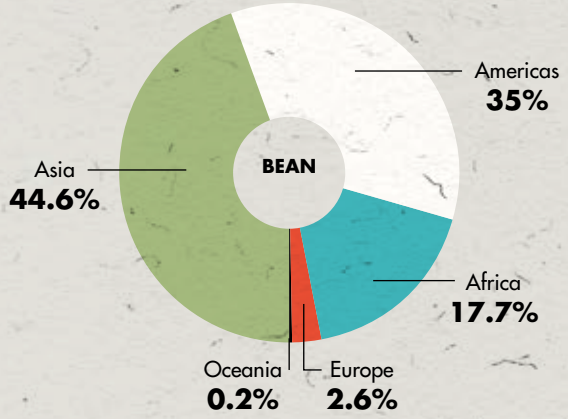
## Need less water to grow

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

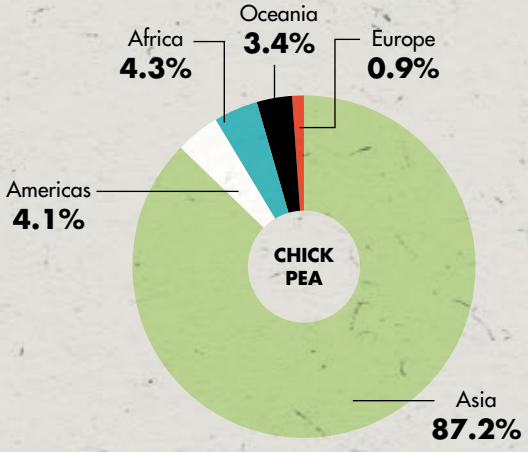
## PRODUCTION SHARE BY REGION




**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.

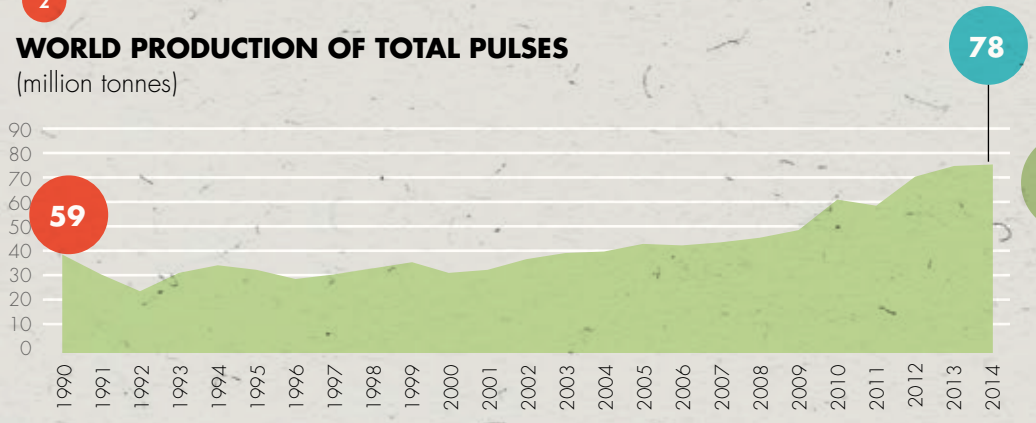
India is the largest producer of chickpeas accounting for **67%** of global production in 2013. This is 10 times the amount of the second largest producer, Australia. Over the period 1978–1980 to 2008–2010, India increased its land area dedicated to chickpeas marginally from **7.6 million hectares** 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.



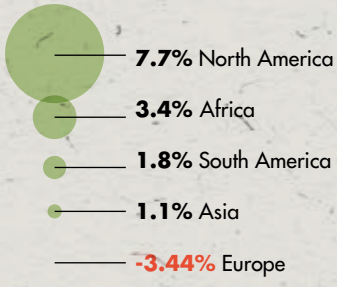

2

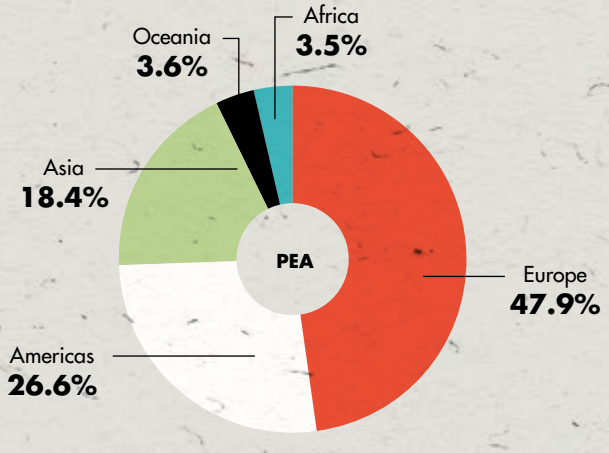
## WORLD PRODUCTION OF TOTAL PULSES

(million tonnes)



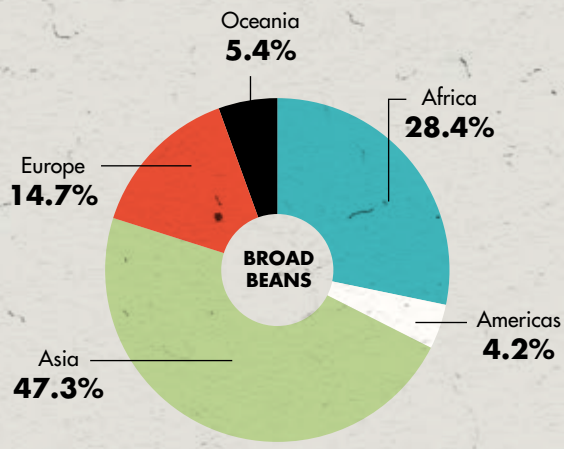

**Annual Growth**

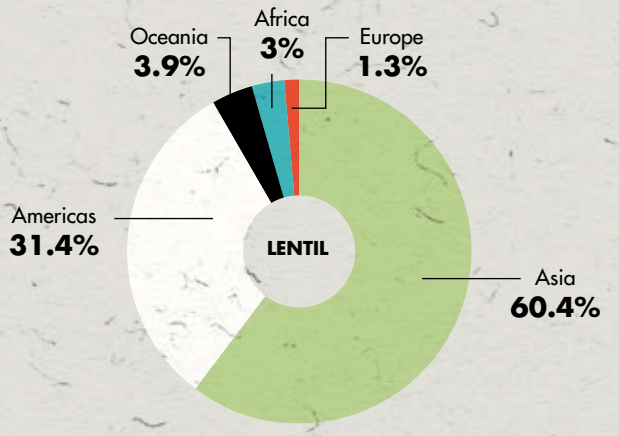





**Pea** is grown commercially in almost **100 countries** with production concentrated in Canada, Russia and China. Jointly, these three countries produce over one-half of the world's dry peas. Canadian dried pea production increased considerably over the past 30 years, expanding from less than **1.57 million tonnes** per year in the early 1980s to approximately **3 million metric tons** 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**.

**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.

3

## WORLD PRODUCTION OF MAJOR PULSES

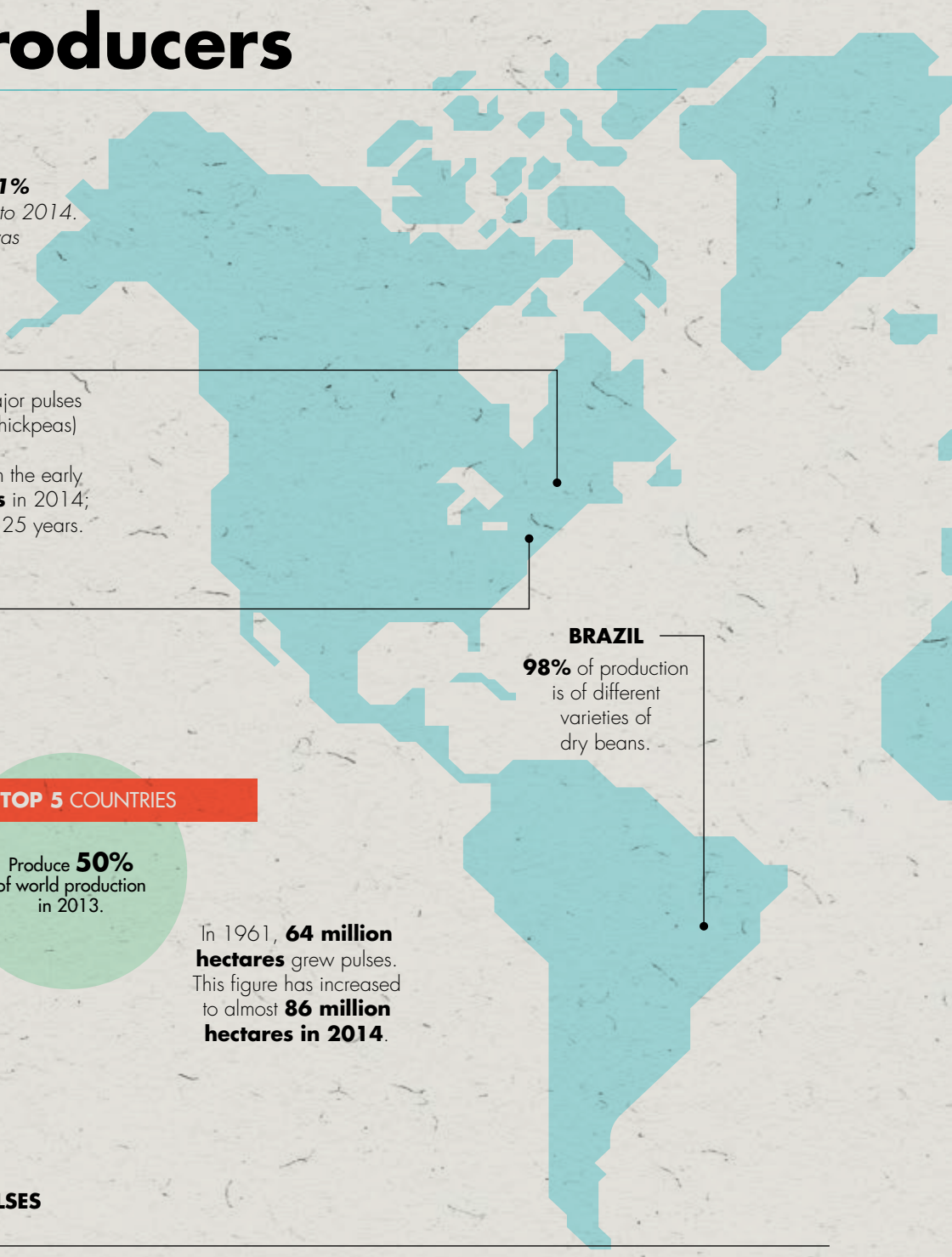
Average 1993 – 2013 (Thousand tonnes)

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

# Major Producers

4

*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.

THE **TOP 5** COUNTRIES

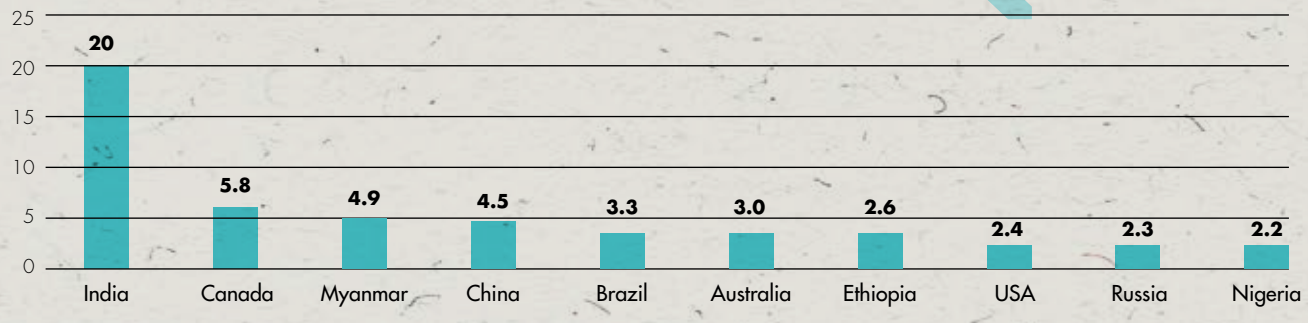
Produce **50%** of world production in 2013.

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**.

5

**MAJOR PRODUCERS OF PULSES**



TURKEY
In 2014, Turkey was the fourth global producer of lentils and sixth worldwide producer of chickpeas.
RUSSIA
The Russian Federation, accounted for **36%** of the world's production of vetches in 2005.
CHINA
China produces **37%** of global production of broad beans.
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.
INDIA
World leader in production: **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.
NIGERIA
Nigeria is the top producer of dry cowpeas.
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%**).

# 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**

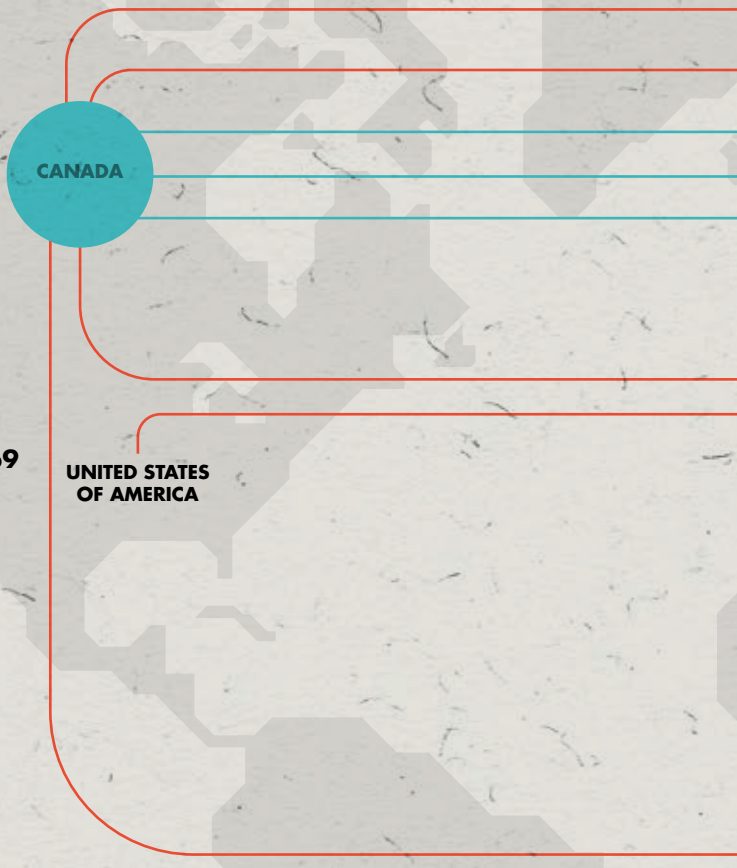
6/ United Arab Emirates **391 069**

7/ Brazil **373 729**

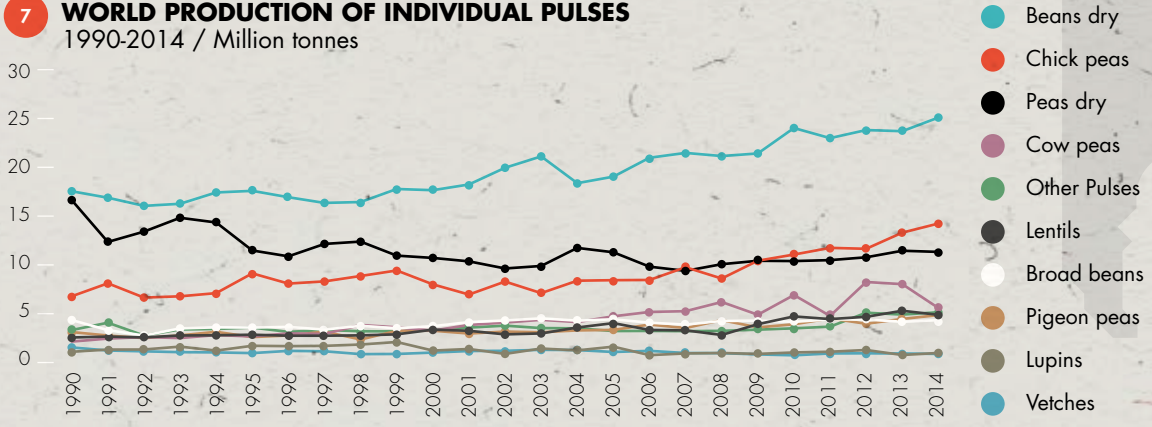
8/ USA **360 838**

9/ Turkey **335 896**

10/ Italy **296 039**



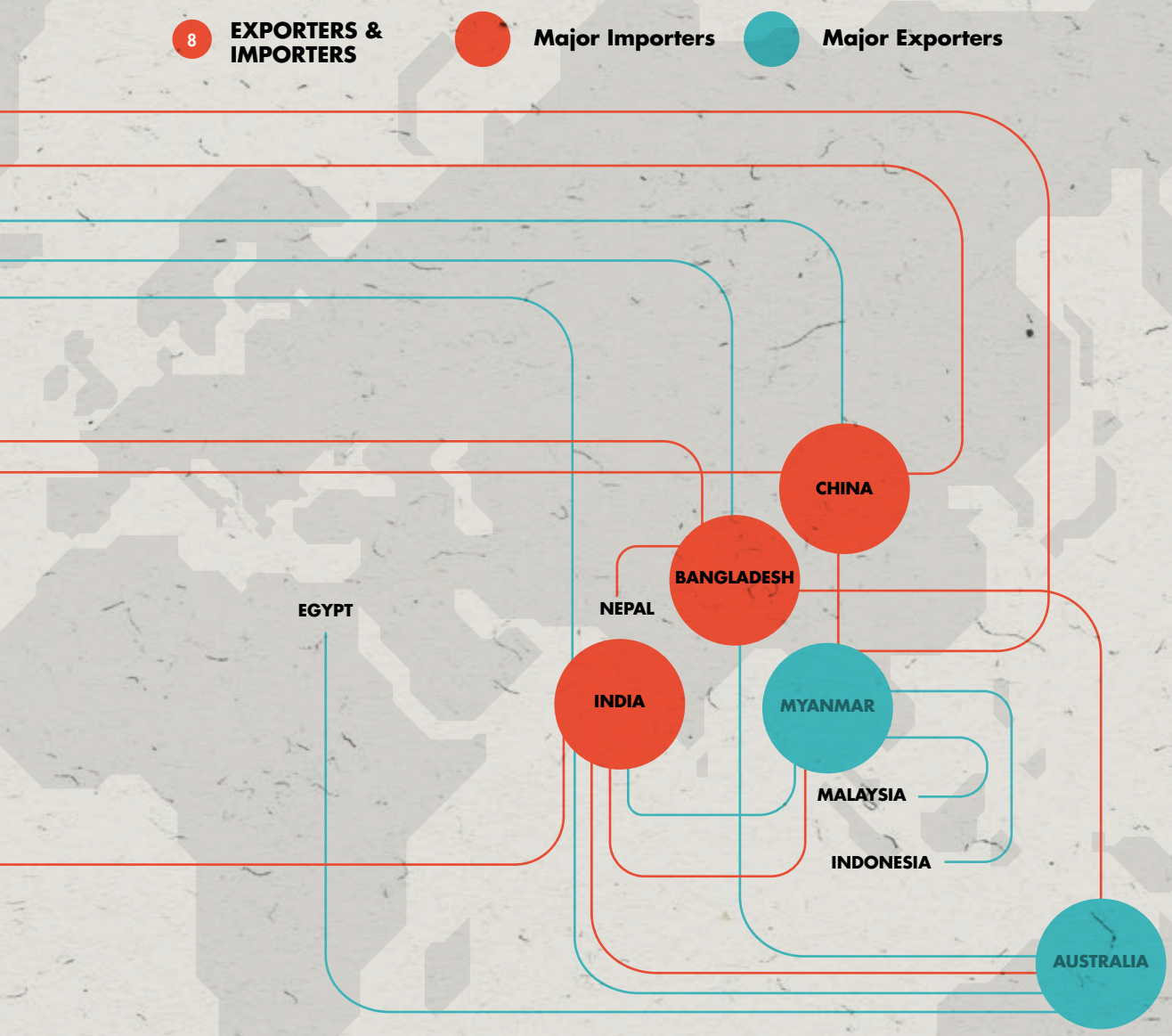

## 7 WORLD PRODUCTION OF INDIVIDUAL PULSES
1990-2014 / Million tonnes



8 **EXPORTERS & IMPORTERS**

**Major Importers**

**Major Exporters**




## CANADA **EXPORT**

| | |
|---|---|
| **India** | 1 527 898 |
| **China, mainland** | 1 002 864 |
| **Bangladesh** | 479 134 |

## AUSTRALIA **EXPORT**

| | |
|---|---|
| **India** | 365 001 |
| **Bangladesh** | 320 378 |
| **Egypt** | 209 805 |

## MYANMAR **EXPORT**

| | |
|---|---|
| **India** | 659 212 |
| **Indonesia** | 50 305 |
| **Malaysia** | 27 692 |

## INDIA **IMPORT**

| | |
|---|---|
| **Canada** | 1 382 456 |
| **Myanmar** | 659 212 |
| **Australia** | 574 800 |

## CHINA **IMPORT**

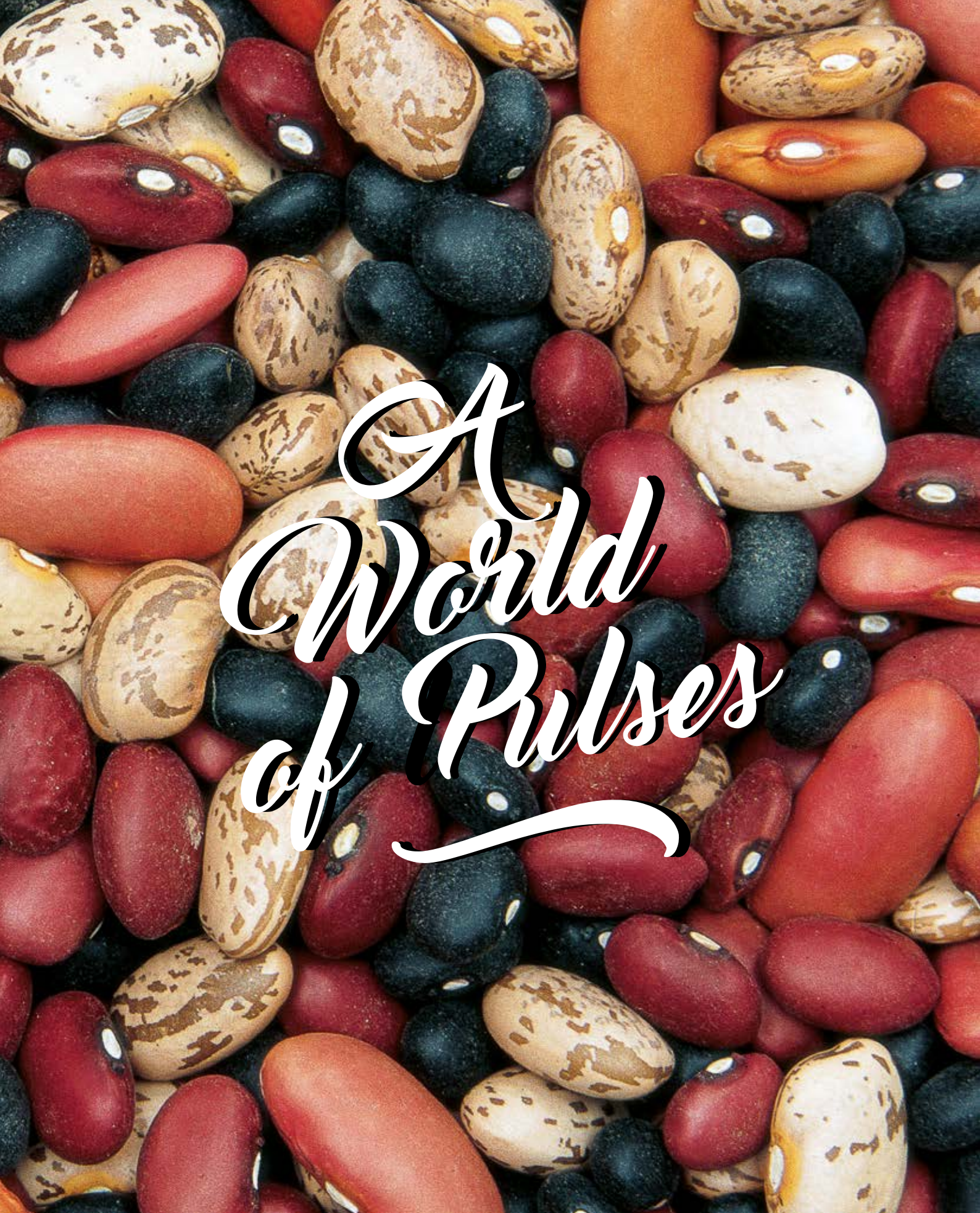
| | |
|---|---|
| **Canada** | 966 497 |
| **United States** | 59 077 |
| **Myanmar** | 15 919 |

## BANGLADESH **IMPORT**

| | |
|---|---|
| **Canada** | 479 134 |
| **Australia** | 320 378 |
| **Nepal** | 11 681 |

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.

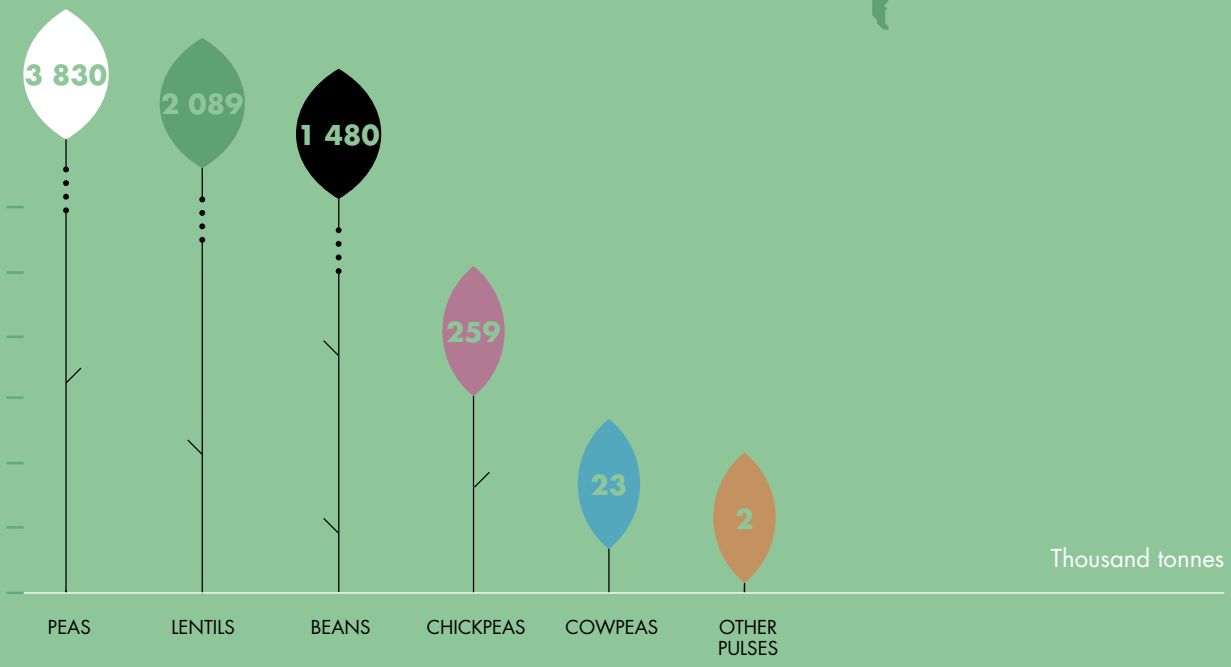
Part
5


A World of Pulses

# 01 NORTH AMERICA

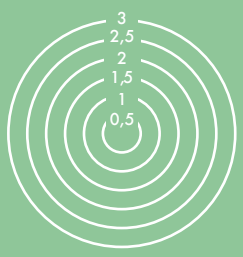
## 01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2010 - 2014)

Dried peas, lentils and, beans are the top pulses produced in the region.

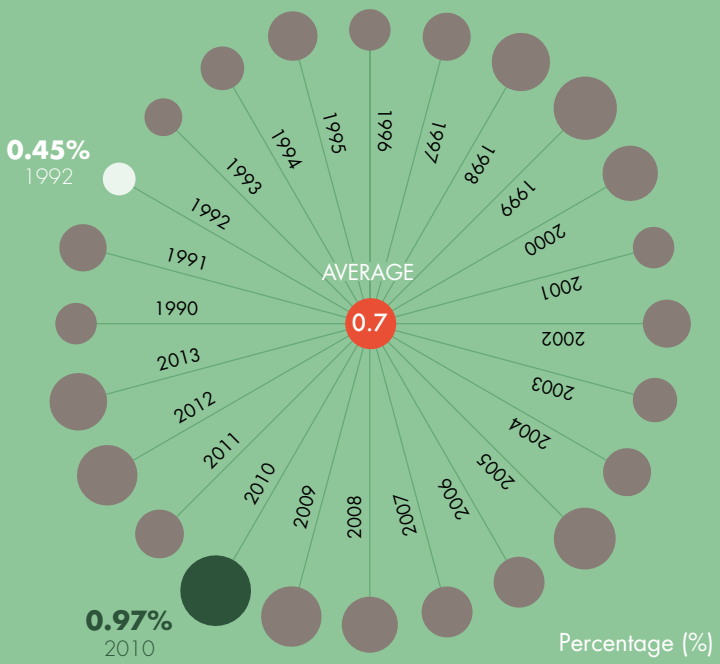



## 02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE

In these years, the production of pulses has doubled.




Maximum value  Minimum value



# North America

## THE SUPERFOOD OF THE FUTURE

**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 due 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 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 Brazil, France, India, Iran, Italy, Mexico, Portugal, Spain and Turkey and all the flavours they bring with them from spicy tarka daal, to hearty feijoãda... To this mix we can add Cajun specialities from Acadia (the old colony of New France), also found in the southern United States. Their unique cuisine is based on 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 their origins with Basque immigrants. Influence from the Canary Islands shows up in pulse stews

**BOULDER, COLORADO, (USA)**
**1.** A view of Chautauqua Park. **2.** Red Lentils sit for sale in Alfalfaís Market bulk section. **3.** Orca Beans. **4.** Produce section in Alfalfaís Market. **5.** Red Kidney Beans. **6.** A view of Colorado in winter. **7.** Chef Ron Pickarski shops for beans in the Alfalfaís Market. **8.** Two cyclists ride towards an underpass on the six-mile long Boulder Creek Path.

1

2

3

4

5

# North America

6

7

8

Dried pulses stored well.

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, and have left their mark in recipes today. And of course, honourable mention must go 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 being replaced by foods rich in vegetable proteins, notably pulses.

## CURIOSITIES

**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.**

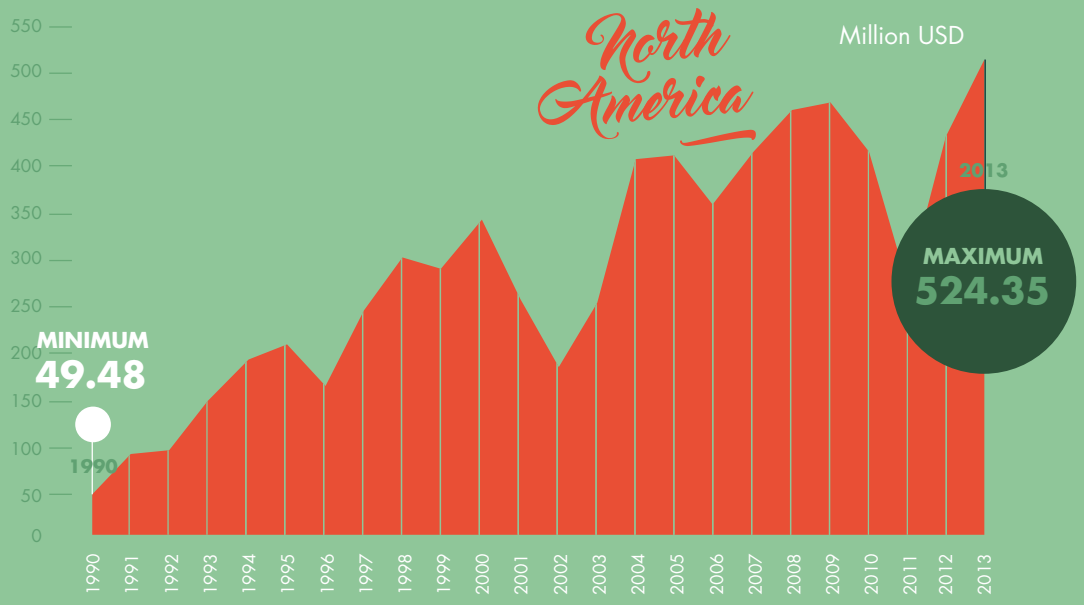
**Tex-Mex food is one of the most clearly documented culinary fusions in the whole of the continent,** and *chili con carne* one of its most famous dishes. By 1907, it was already inextricably linked to red kidney beans, as witnessed in Janet McKenzie's *The Boston Cooking School Magazine of Culinary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

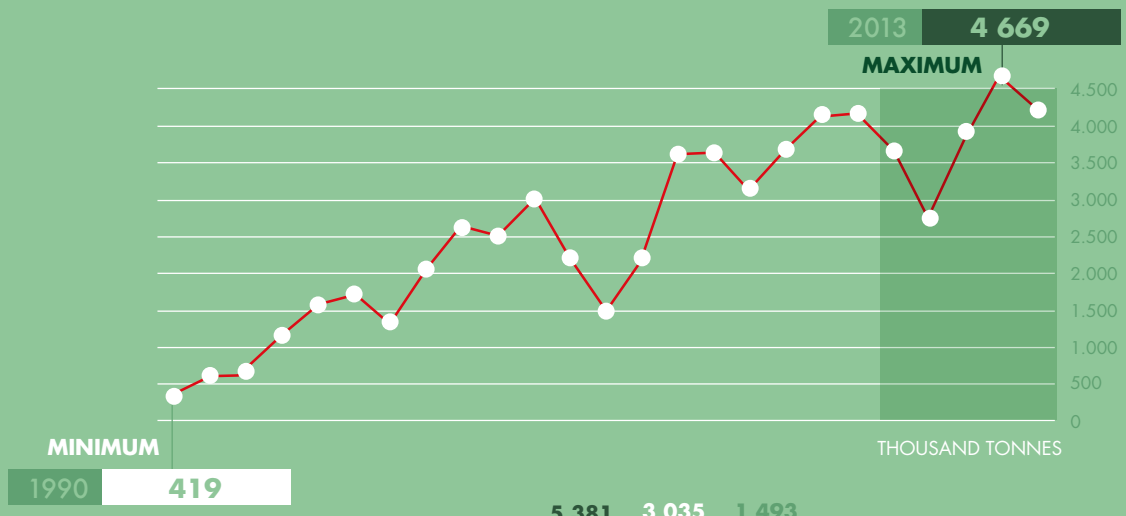



04

## PRODUCTION OF PEAS

Production has increased exponentially over the years.

**2010-2014**
**3 830**
THOUSAND TONNES




05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

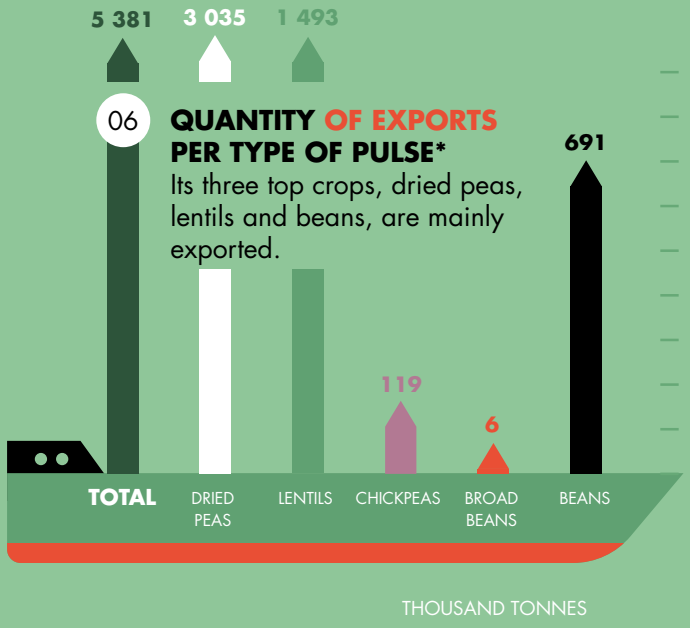
North America imports a modest quantity of pulses every year.

THOUSAND TONNES

06

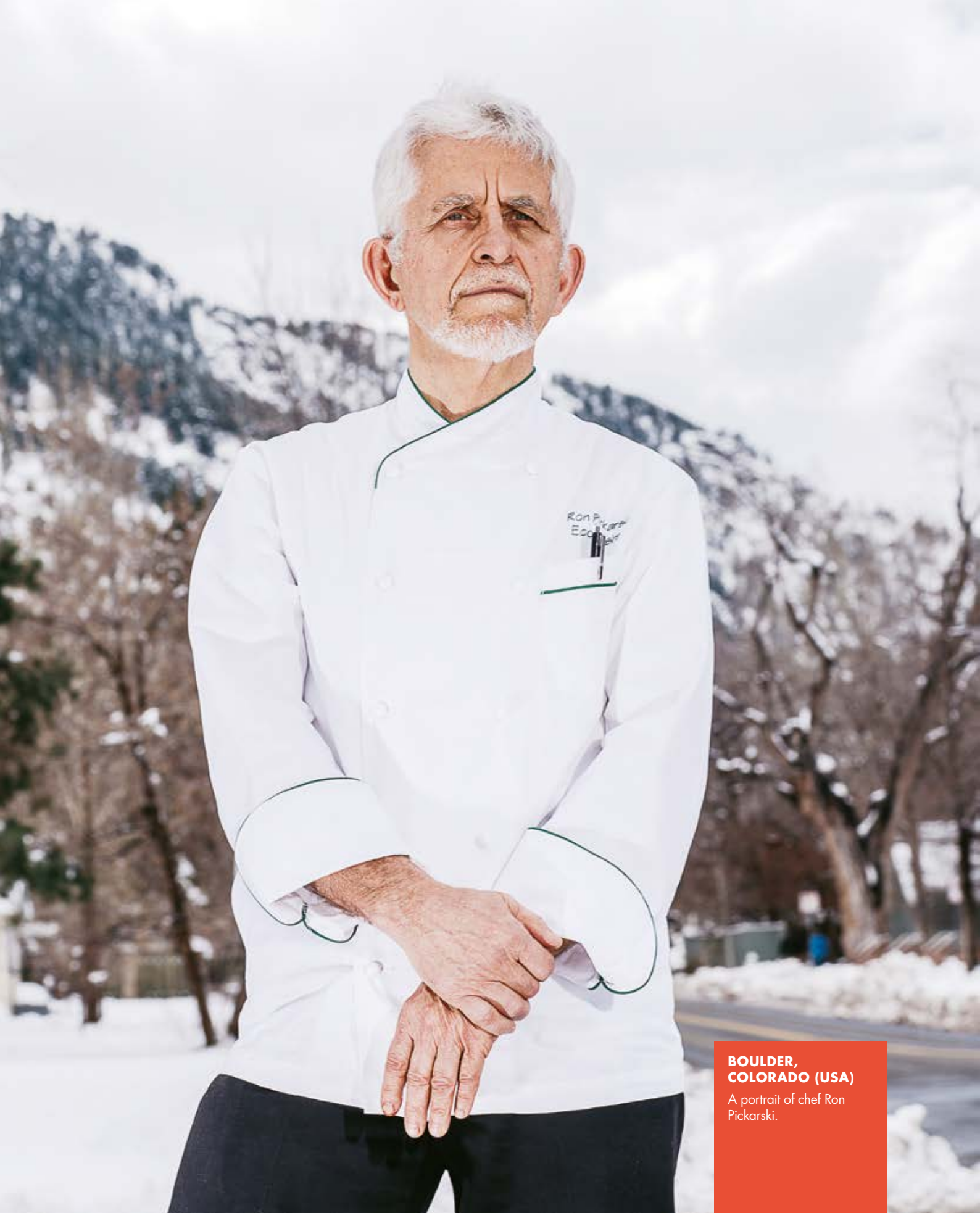
## QUANTITY OF EXPORTS PER TYPE OF PULSE*

Its three top crops, dried peas, lentils and beans, are mainly exported.




THOUSAND TONNES

* 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.

## NORTH AMERICA'S BRIGHT FUTURE OF PULSES

# RON PICKARSKI AND ECO-CUISINE

Ronald A. Pickarski has become a rising star for vegetarian chefs specialising in pulses. He combines pulses with spices and wheat flour, creating a vegetarian meat substitute, turning this into prime veggie burgers, the taste and texture of which resemble 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.

The chef prepares vegetables for his white bean polenta.

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.

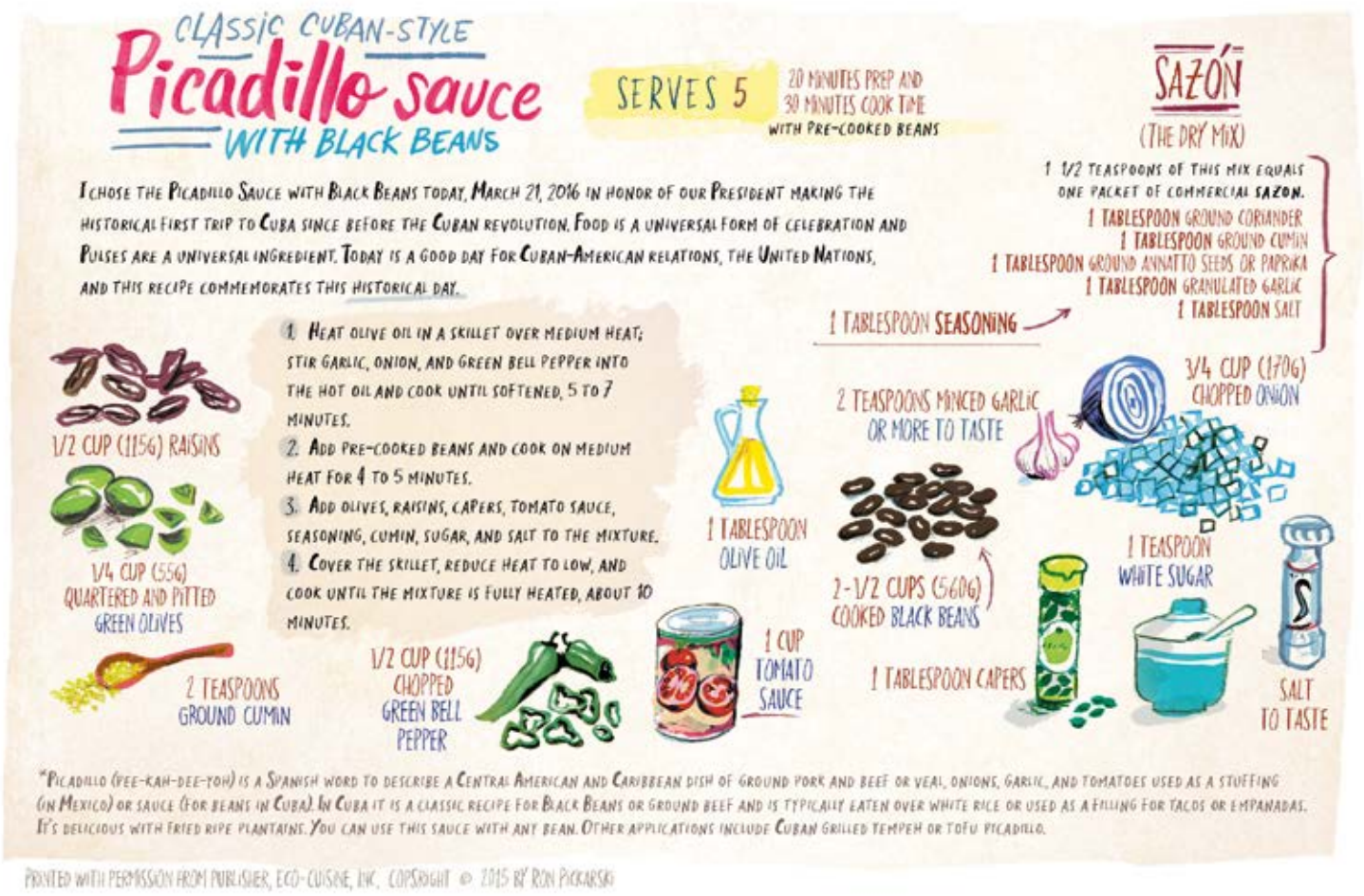
Currently living in Boulder (Colorado), Ron is the Executive Chef of Eco-Cuisine Inc., the company he founded in 1993. They provide consultancy services to promote healthy eating, research natural foods, develop products based on plant proteins and organize gourmet vegetarian cooking classes. He holds 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 with the mission 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

Chef Ron Pickarski in the kitchen of the University of Colorado Boulder.

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 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.

*ISBN: 978-0-692-41536-8. 400 pp. **eco-cuisine.com**

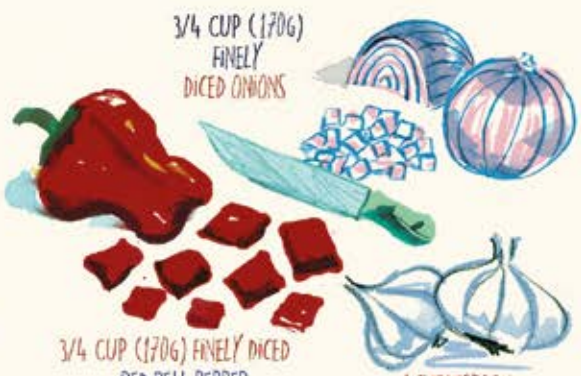
# Cannellini Bean Polenta Loaf

6 ENTRÉE SERVINGS
OR 12 SIDE DISH SERVINGS

CANNELLINI BEAN POLENTA MAKES A COMPLETE PROTEIN WITH THE BEAN-GRAIN COMBINATION. IT IS AN ENTRÉE 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 THAN 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.



3/4 CUP (170G) FINELY DICED ONIONS

3/4 CUP (170G) FINELY DICED RED BELL PEPPER

1 TABLESPOON MINCED FRESH GARLIC

2 TABLESPOONS EXTRA VIRGIN OLIVE OIL

1/2 CUP (115G) PITTED AND CHOPPED KALAMATA OLIVES

1 TABLESPOON GROUND FENNEL SEED

2 CUPS (450G) CANNELLINI BEANS (OR DARK RED KIDNEY BEANS FOR COLOUR)

1-1/2 CUPS YELLOW CORNMEAL OR CORN GRITS*

3-1/2 CUPS WATER

1 TEASPOON SALT

1/4 CUP (55G) CHOPPED FRESH CILANTRO

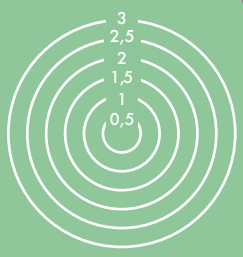
# 02 CENTRAL AMERICA AND THE CARIBBEAN

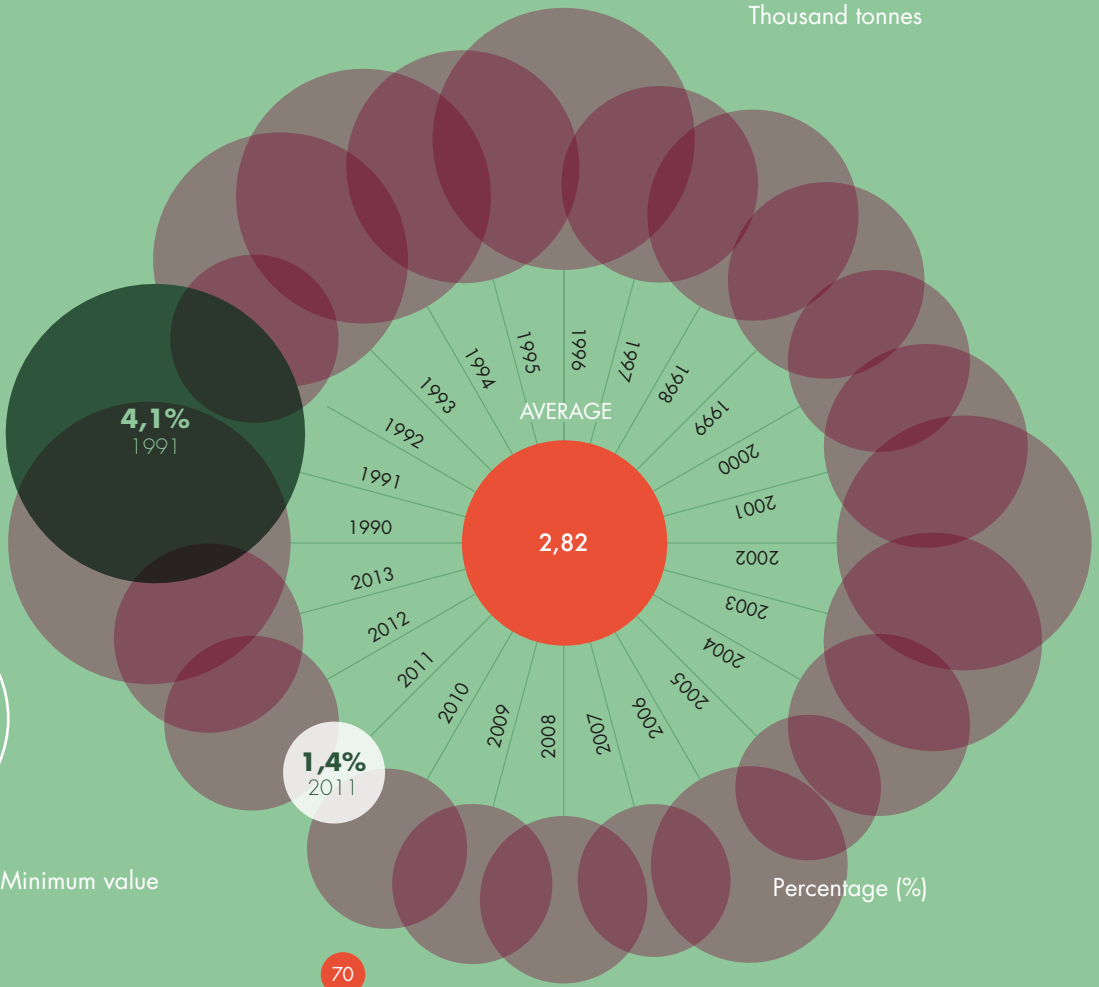
## 01 QUANTITIES PRODUCED BY TYPE OF PULSE

An incredible variety and amount of beans are produced in Central America.

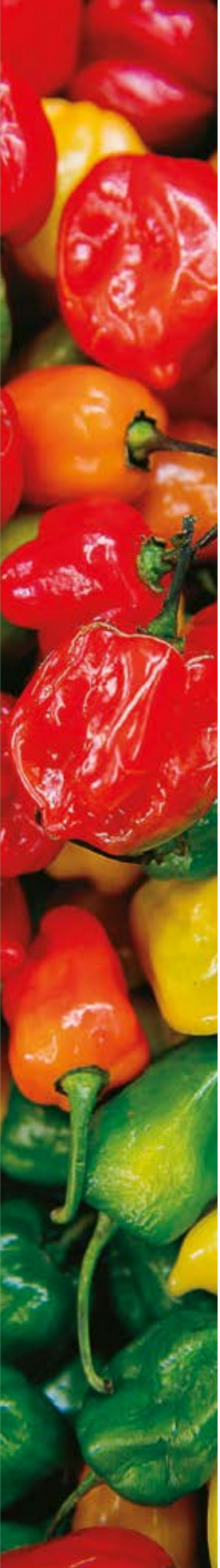
## 02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE

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




Maximum value  Minimum value



# Central America and the Caribbean

## A HUNDRED CENTURIES AND A HUNDRED TYPES OF BEAN

**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 influence of beans

COCHINITA PIBIL
El Turix
GREEN
DOMINGO
13:00-21:00
LUNES A SABADO
13:00-24:Hrs
Sin
JUEVES
VIERNES
SABADO
10:00
24:00
DOMINGO SOPA DE LIMA
TAMBIEN EN
PZA. SN ANGEL
SN JACINTO

1

Girasol
Lenteja con Sal
Trigo con Chile
Platano

2

EL REY DEL DURO
DURAZO #1

3

4

5

6

7

8

**MEXICO CITY (MEXICO)**
**1.** El Turix Yucateca taco stand **2.** Salted lentils on display in the Medellin market. **4, 7** and **8.** Different ingredients in the market Medellin.
**5.** Shopkeeper selling pulses

**ZACATEGAS (MEXICO)**
**3.** Taco stand.

**MERIDA (MEXICO)**
**6.** The taco stands at Yucateca, Taquiera New San Fernando.

in pre-Columbian cultures such as the Olmec, Maya, Aztec, Mexica, 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 the Antillies,

**QUERÉTARO (MEXICO)**
Two locals enjoying a snack in the market San Juan del Rio.

Cuba, the Dominican Republic, El Salvador, Honduras and Nicaragua. It is also accepted among food historians that following the arrival of the Spanish in the Americas, 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 references 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 prevalent in traditional Mexican cuisine, in contrast are grown primarily in the states of Michoacán and Guanajuato, but whose local production only consumes a small proportion of national demand.

## CURIOSITIES

**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 *botana* (appetisers). Chickpeas are often sold in markets pre-soaked and in transparent bags, ready for cooking to your heart's desire.

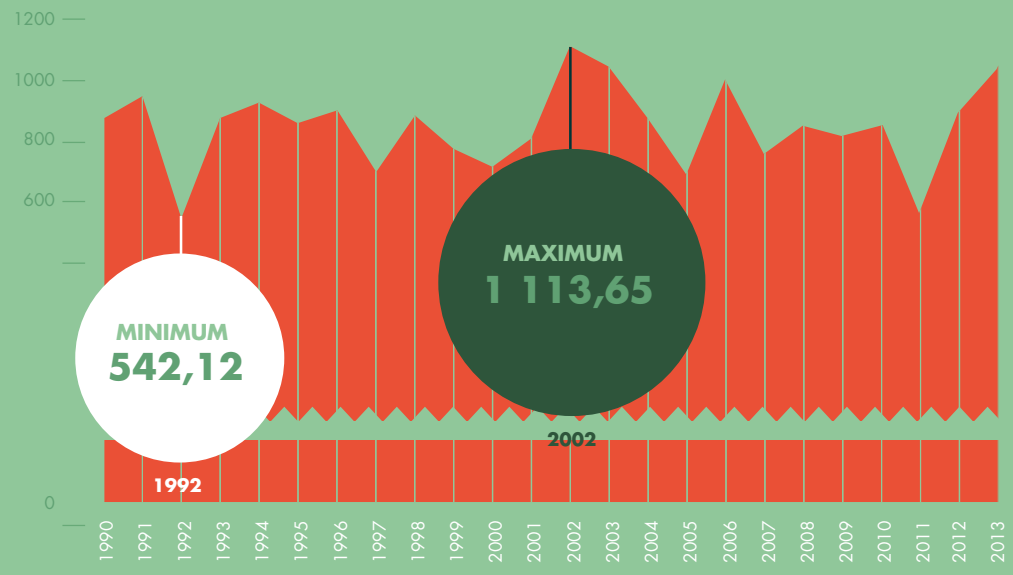
**What's in a name? Mexico, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Puerto Rico** call bean plants *plantas del frijol*. Bean pods are called *ejotes* (from the Na'huatl *exotl*), although in Costa Rica they go by the name of *vainicas*. In Panama, red kidney beans and black turtle 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

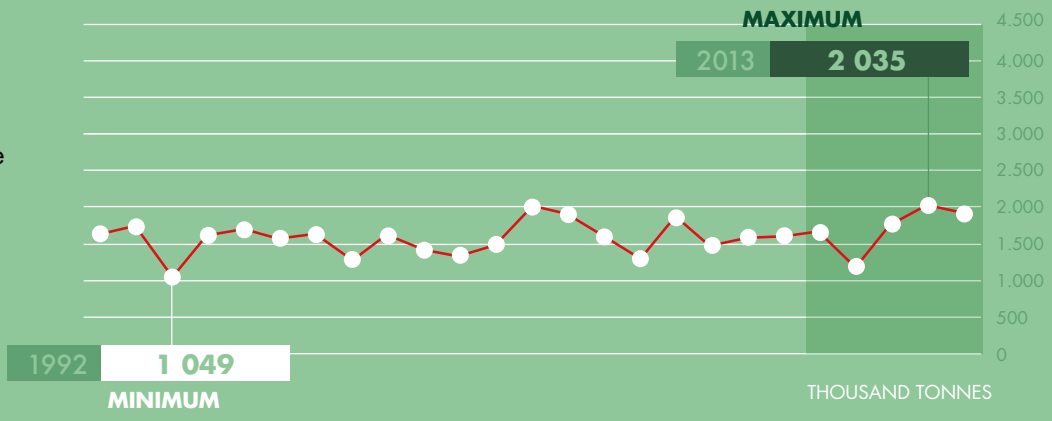



04

## PRODUCTION OF BEANS

Production levels have remained relatively stable over these years.

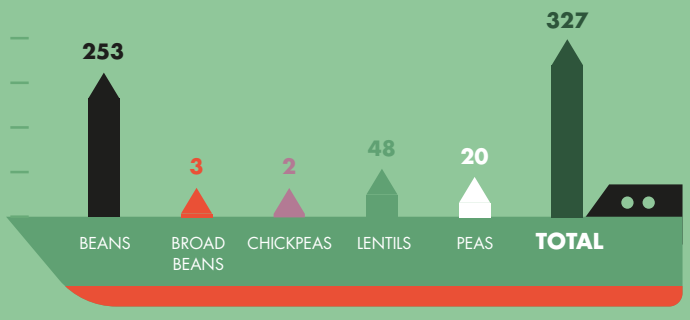
2010-2014
**1 718**
THOUSAND TONNES




05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

Beans are by far the largest import in Central America.

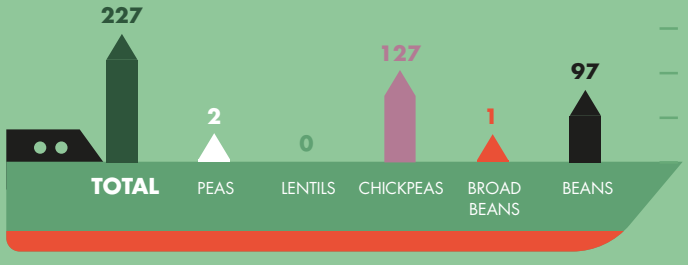



THOUSAND TONNES

06

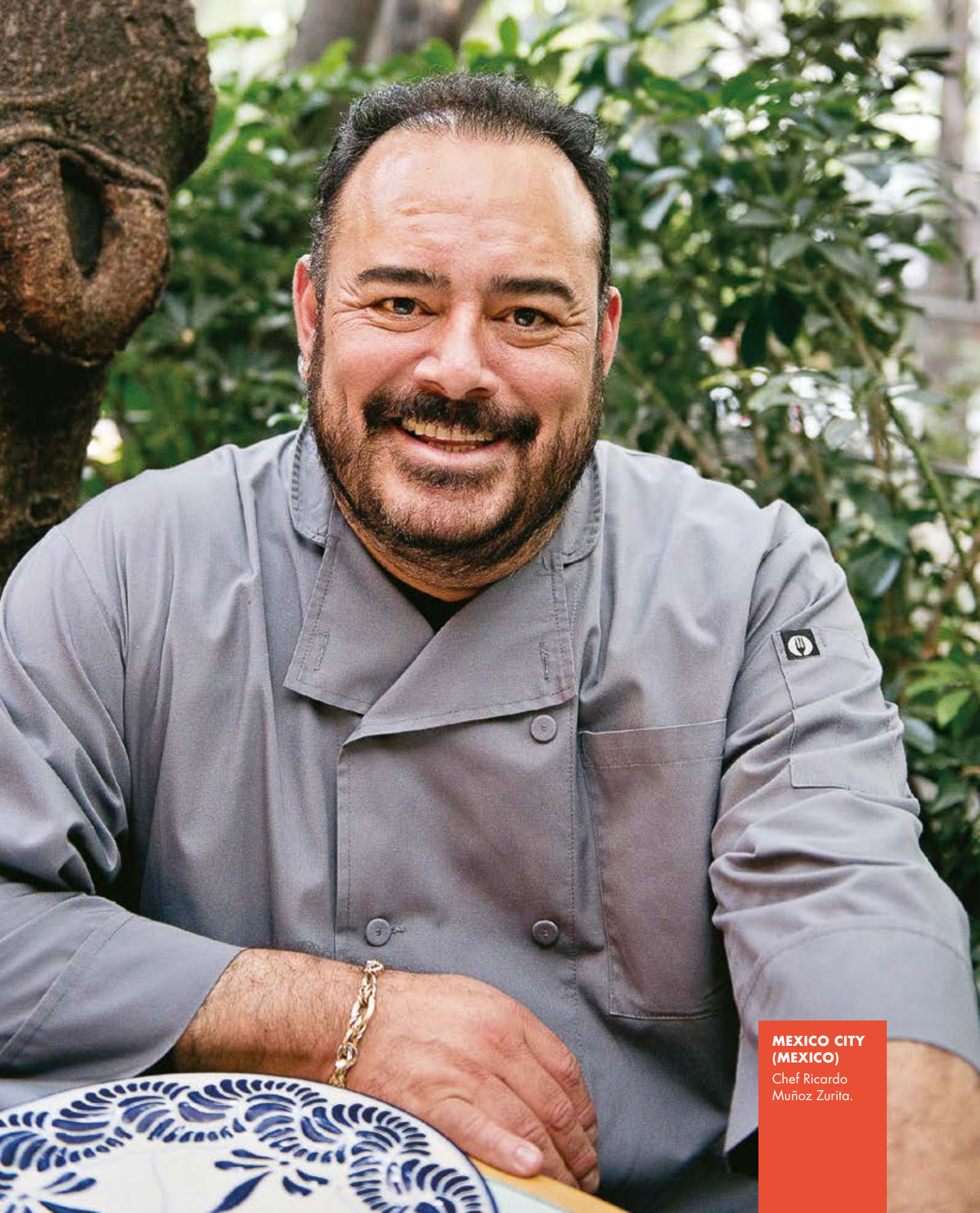
## QUANTITY OF EXPORTS PER TYPE OF PULSE*

Central America's main exports are chickpeas.




THOUSAND TONNES

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.



**MEXICO CITY (MEXICO)**
Chef Ricardo Muñoz Zurita.

# RICARDO MUÑOZ ZURITA, BUILDING AN ALMANAC OF BEANS

Since the Aztec Empire, Mexico has had a culinary history continuing up to today. The country's farming traditions and unusual growing techniques, along with its sensitivity to infuse ancestral influences, are all factors that have carried Mexican cuisine to be recognized 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

Chef Ricardo Muñoz Zurita buying ingredients in the Medellín market (Mexico City).

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 are often 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 led us to eat pulses and cereals together, thereby increasing the nutritional potential of proteins. This practice produces a synergistic effect that, in the case of beans, triggers an abundance of

# Central America and the Caribbean

Chef Muñoz Zurita in his restaurant Azul Condesa preparing a bean salad.

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 dried 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-up 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

## 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)

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 frijoles 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.

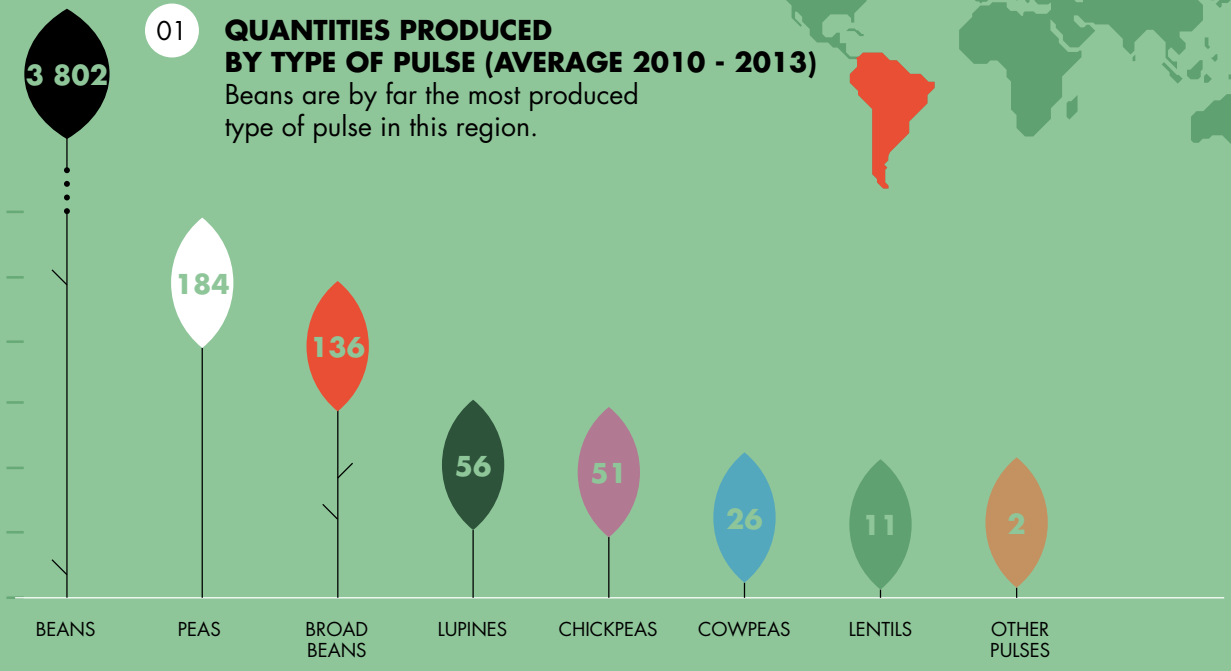
This preparation is a base for many recipes, such as panuchos and papa negro, and can also be served with meat, fish or as a main course. It can be prepared with canned black beans to shorten preparation time.

* Yellow and elongated, also called güero chilli

# 03 SOUTH AMERICA

## 01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2010 - 2013)

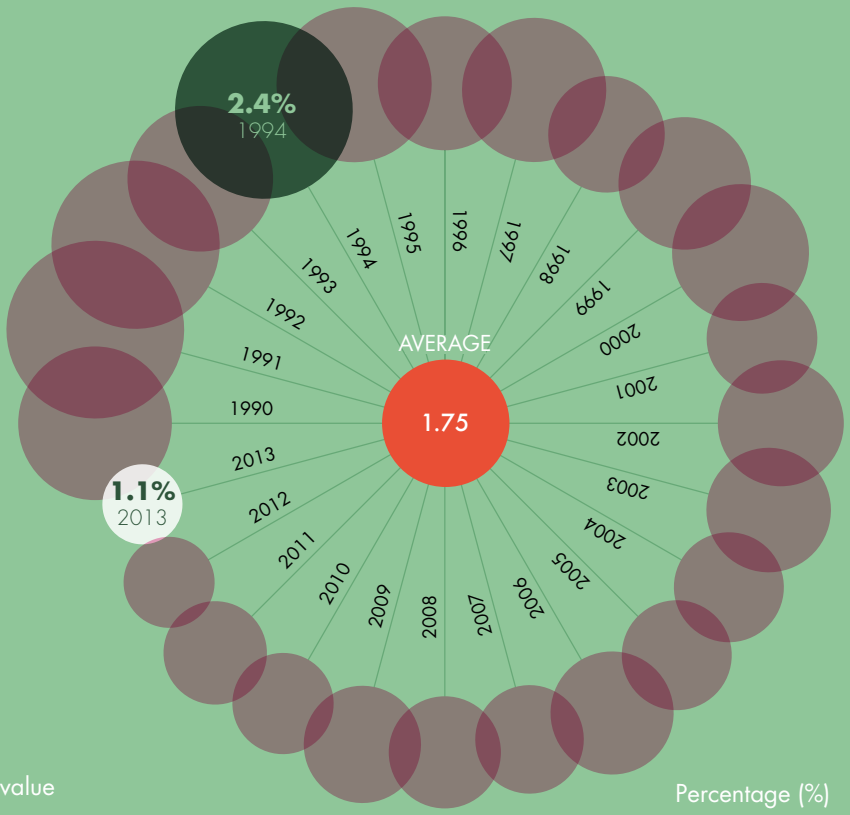
Beans are by far the most produced type of pulse in this region.

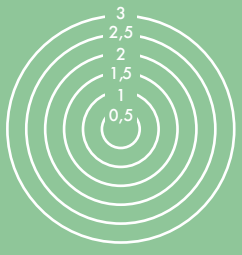



Thousand tonnes

## 02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE

In these years, the value of pulses decreased by more than 50%.




Maximum value  Minimum value

Percentage (%)

# South America

## FRIJOLES, FRISOLES, FEIJÕES

**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, including beans. 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. 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.

1

REUTERS/Eric Gaillard

2

**RÍO DE JANEIRO (BRAZIL)**
**1.** View of the favela buildings from one of the terrace of The Maze hotel located in the Tavares Bastos slum.

**CUIABÁ (BRAZIL)**
**2.** A couple wearing Brazil shirts work at their stall at the port market.

**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.

3

REUTERS/Damir Sagolj
4

REUTERS/Nacho Doce
5

REUTERS/Ricardo Moraes
6

Feijoada (black beans) in the restaurant, *A Figueira* in São Paulo.

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 à 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 Rîo 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 *braganços* – 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.

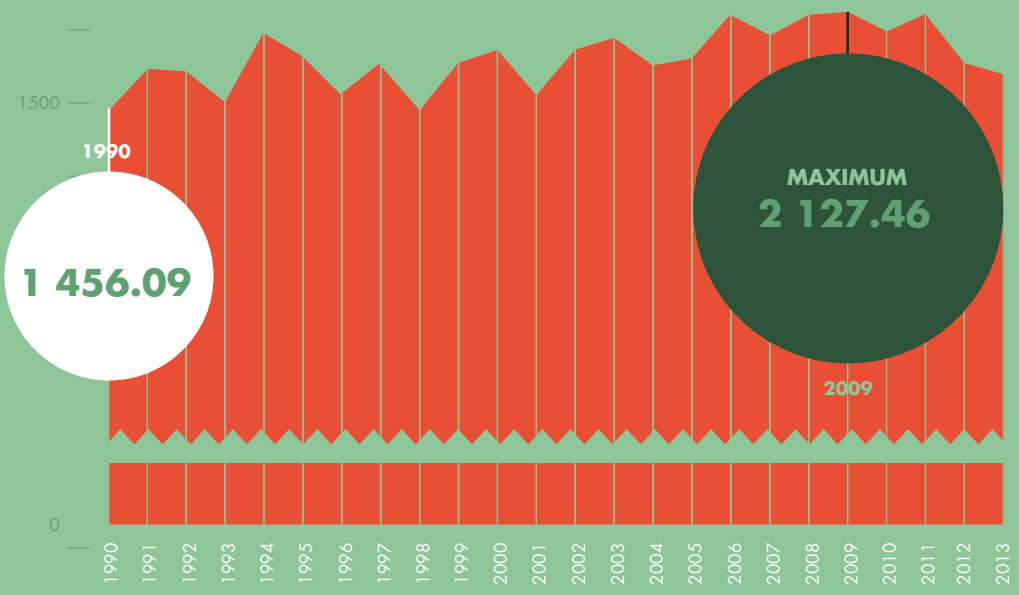
**The *feijoada Maní* is the most innovative interpretation on record of Brazil's national dish.** It was created by Helena Rizzo and her husband, chef Daniel Redondo in 2009. It occurred to them during a trip to Spain, when the famous chef Ferran Adrià developed the culinary technique, *spherification*, 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 *feijõada*.

***Judía, frijol, poroto, haba, habichuela, feijões, fréjol, frísol, fríjol, fréjol and frijón* are all words denoting beans** in South America, often with different stresses, like in the plural *frijoles*, 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.



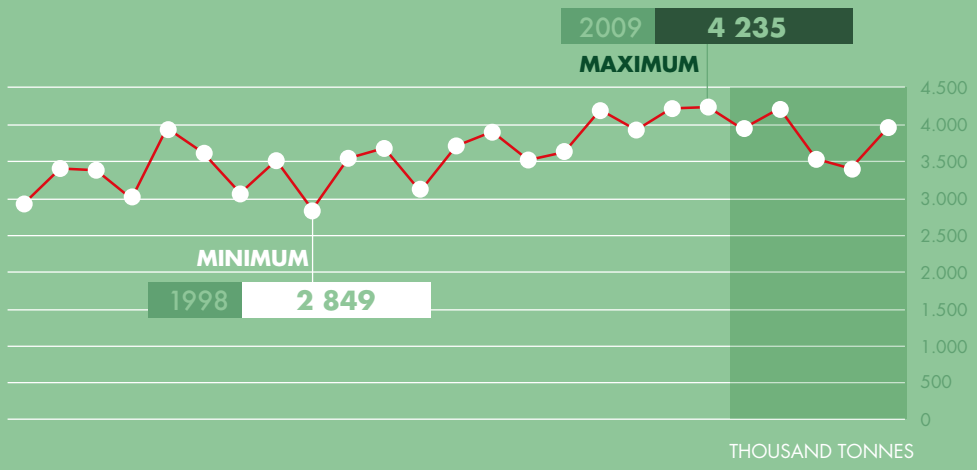

1990-2013

**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

THOUSAND TONNES

05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

South America imports roughly 50% more than its exports.

THOUSAND TONNES

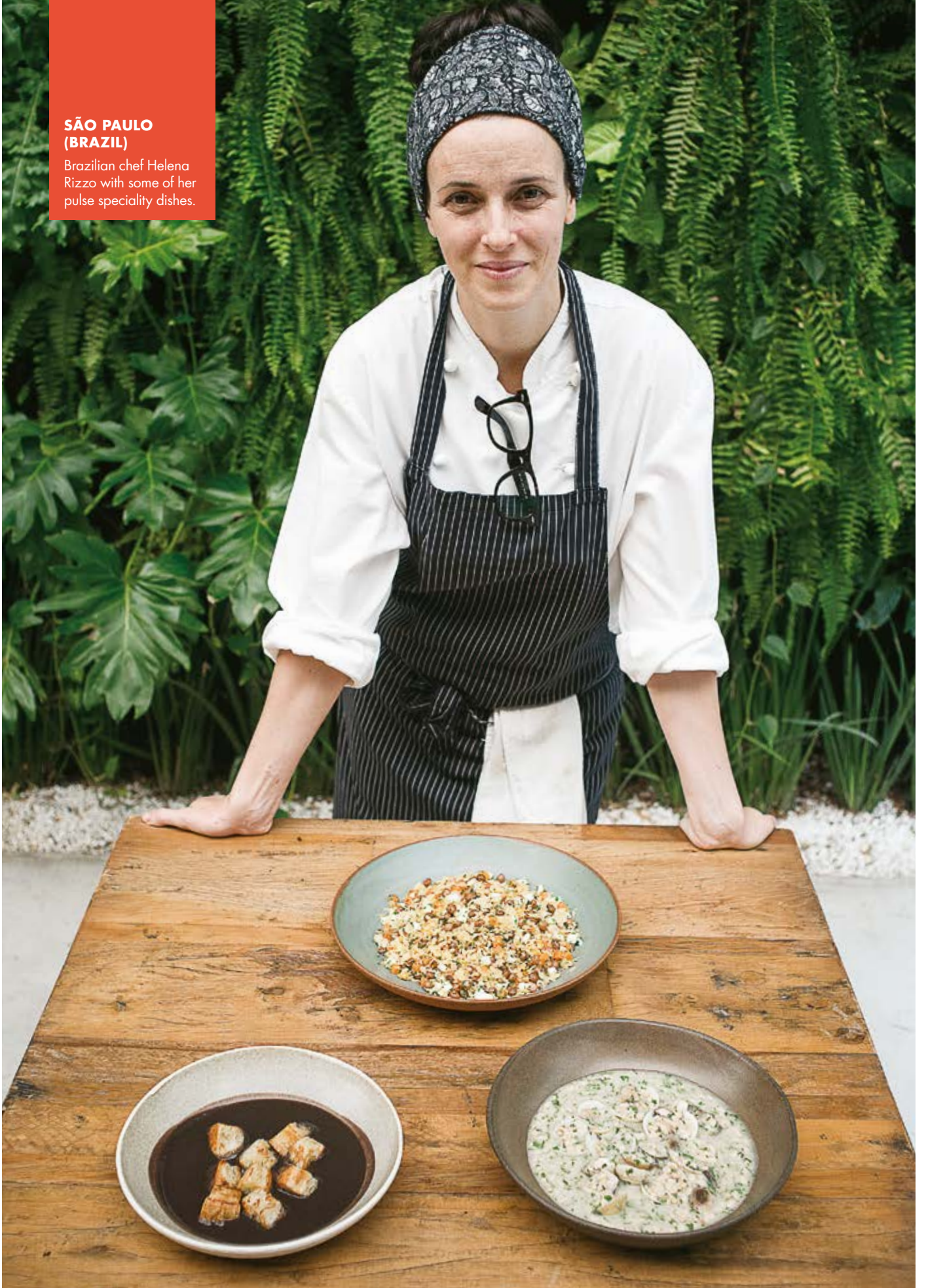
06

## QUANTITY OF EXPORTS PER TYPE OF PULSE*

Not surprisingly, beans are South America's highest exports.

THOUSAND TONNES

* 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.

# HELENA RIZZO AND HER INNOVATIVE CLASSIC *FEIJOÃDA*

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 *feijoada*, testifying to the lasting importance of this national dish, it would

Chef Rizzo selecting pulses at the market.

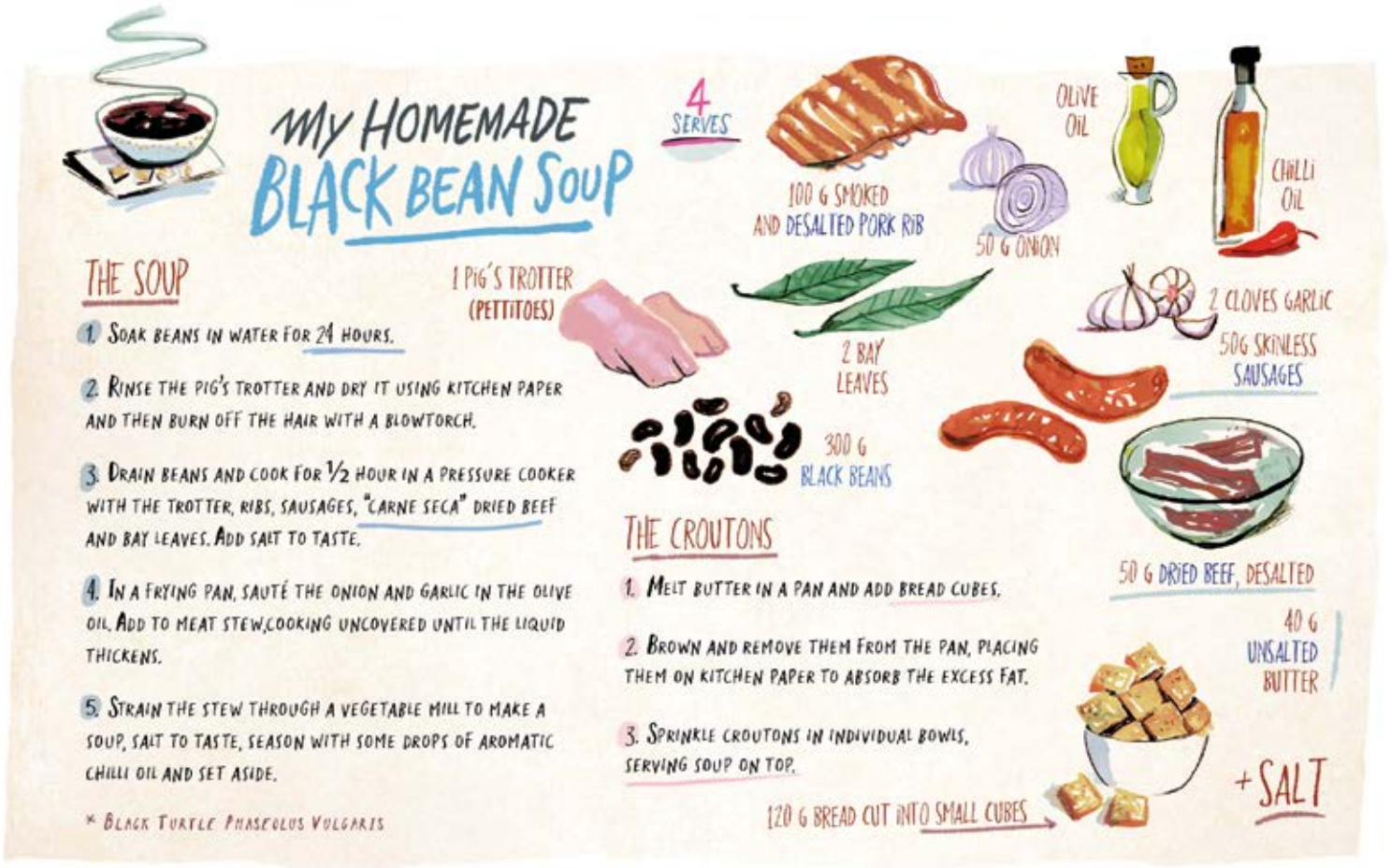
appear that an awkward classist attitude has arisen; one that tends to snub popular, traditional dishes in favour of more trendy tastes. And with it, reducing the prominence of locally grown produce and traditionally prepared stews and diminishing the presence of pulses in some of the best known eateries.

World-famous Brazilian chef, Helena Rizzo, has set out to singlehandedly buck this trend and boldly reinstate the humble pulse. Her signature *feijoada* 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 with 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 Latin America. The following year, she was crowned the 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 *Celler 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 the wide variety of dried beans 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."

SERVE 4

# COWPEAS with CLAMS AND MUSHROOMS

SOAK BEANS IN WATER FOR 24 HOURS AND DRAIN.

+SALT

BOIL IN FRESH WATER FOR 1 HOUR 40 MINUTES, ADDING SALT TO TASTE, BAY LEAVES AND HAM.

REMOVE BAY LEAVES AND HAM.

BLEND A THIRD OF THE BEANS AND THEIR LIQUID INTO A VERY SMOOTH PURÉE.
MIX BACK IN WITH THE BEANS.

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.

feijões de corda

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.

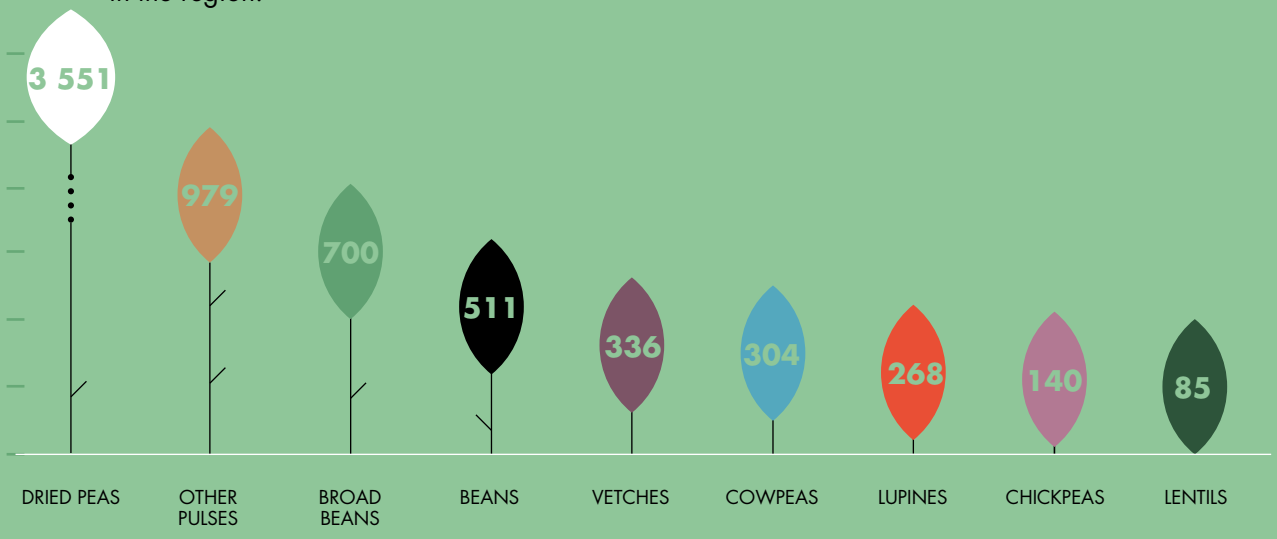
feijões de corda

* SCIENTIFIC NAME: VIGNA UNGUICULATA, ALSO KNOWN IN BRAZIL AS FEIJÕES DE CORDA

# 04 EUROPE

## 01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2009-2013)

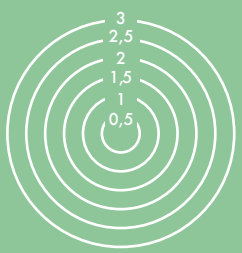
A glance at the production of different pulses in Europe shows that dried peas are the most produced in the region.

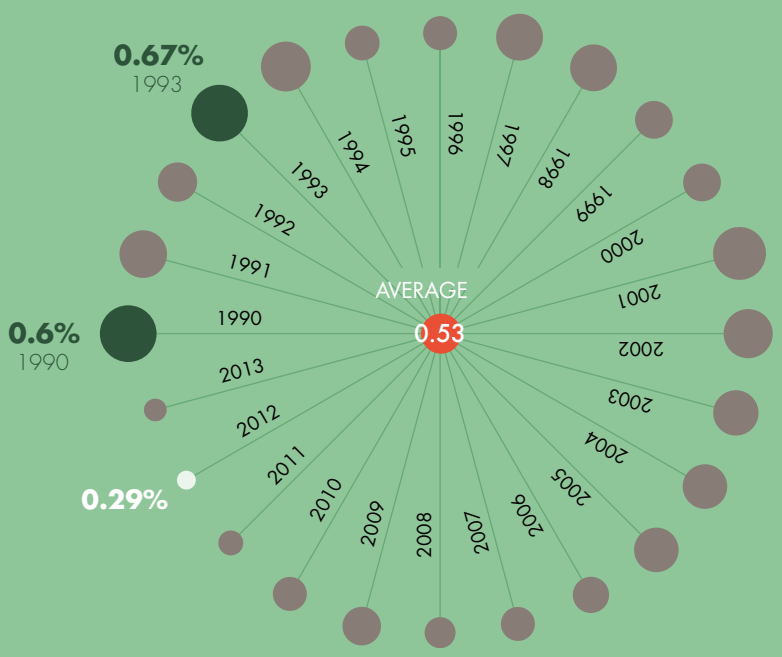



Thousand tonnes

## 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.




Maximum value  Minimum value

Percentage (%)

# Europe

## THE OLD WORLD'S STORE CUPBOARD

**"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, the 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 overseas 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,

1

2

3

4

5

**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.** Alimentación 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 Alimentación 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*

6

CANELA
BLANCO
AVILA
8,60€
CAPARRON
DE LA
RIOJA
8€
MORADA
DE
BARCO
AVILA
6€
LENTEJA
CAVIAR
3,95€
LENTEJA
DE
SALAMANCA
3,40€
LENTEJA
FRANCESA
3,20€

7

JUDIAS
DE
LEON
4,90€
FRIJOLES
NEGROS
4,40€
ALUBIAS
DE
TOLOSA
16€
LENTEJA
PARDINA
3,20€
LENTEJA
FRANCESA
DE
PUY
5,50€
VERDINA
ESPECIAL
MARISCO
PIZARRO
18€

8

mari carmen
LÉGUMBRES
FRUTA PREPARADA

9

10

Spanish Chef Abraham Garcia buying pulses in Casa Ruiz, a specialized shop offering a wide range of European pulses (Madrid).

but 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 speciality. Indeed, there is no other country where pulses appear so frequently in traditional cuisine.

In Spain, chickpeas are the mainspring of more than 20 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 representing farming excellence and meticulous methods of production, inextricably linked to each of the regions where they are grown.

## CURIOSITIES

**_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.

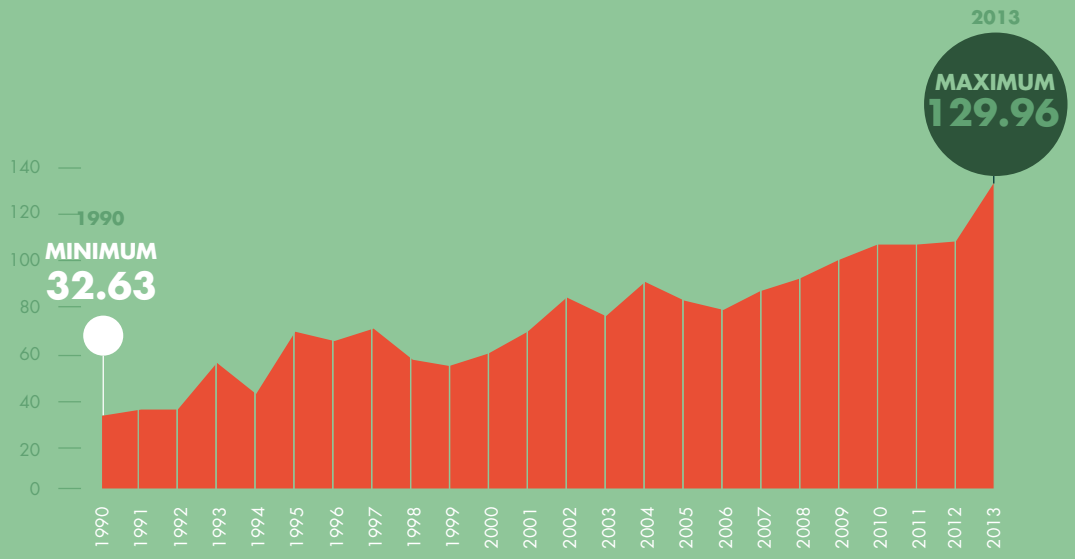
**_Cocido castellano_, also called _cocido madrileño_, pays homage to chickpeas,** the pulse most often associated with Spain. A rural and unpretentious dish, the *Lhardy* restaurant in Madrid added it to the menu in 1839. Its main ingredient has taken pride of place in Spain as the emblem of the Spanish 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

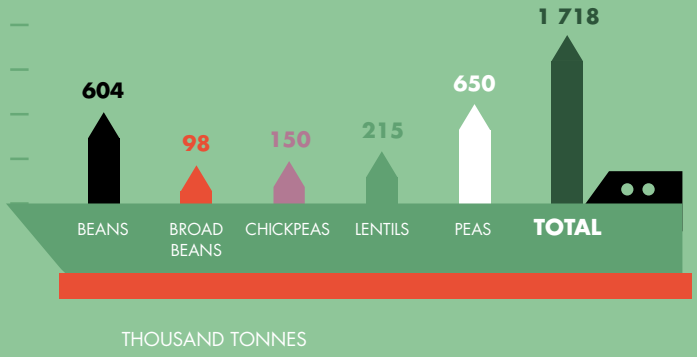
Levels fell steadily since 1990 and only from 2012 that farmers began to produce more dry peas in Europe.

**2010-2014**
**3 550**
THOUSAND TONNES

05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

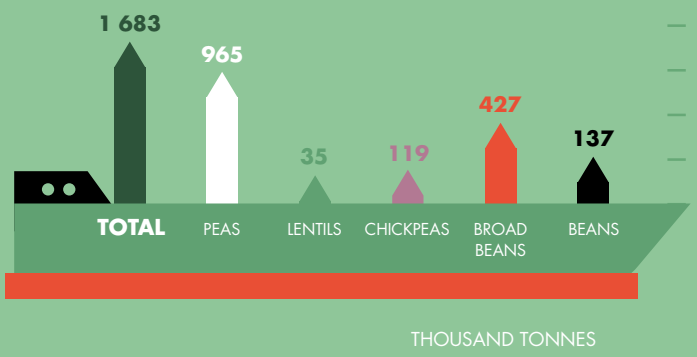
Europe imports a total of 1 718 000 tonnes of pulses each year.




06

## QUANTITY OF EXPORTS PER TYPE OF PULSE*

On average, Europe imports slightly more than it exports, namely 1 638 000 tonnes each year.




* 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*.

## SURPRISE AND SUBSTANCE BY THE HANDFUL

# ABRAHAM GARCÍA BRINGS FOSSILS BACK TO LIFE

The Spanish chef Abraham García choosing pulses in Casa Ruiz.

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

taking then-conservative Spanish palates on a journey of cosmic fusion to experience a wider world of flavours. Such cutting-edge aspirations strengthened rather than weakened his love for the simplicity of pulses. He researches and creates new tastes with pulses and thereby widens 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 our plates.

Abraham García is a chef who is at once impulsive and sensitive, learned and primal, intuitive and

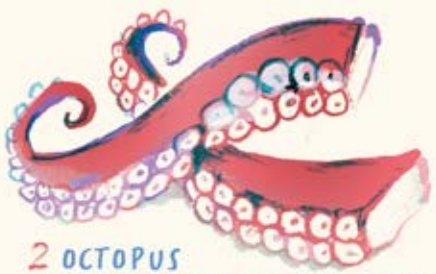
# TAPAS

TAPAS ARE SPAIN'S MOST POPULAR SIDE DISHES. THEY ARE AN IMPORTANT PART OF A CASUAL CUISINE THAT FREQUENTLY ACCOMPANIES DRINKING ALCOHOLIC BEVERAGES.

TAPAS CAN SATISFY HUNGER PANGS AND ACCENTUATE THE FRIENDLY AMBIENCE OF BARS- WHERE BEING WITH FRIENDS, AND GOING FROM PLACE TO PLACE EATING DIFFERENT TAPAS, HAS BECOME 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



2 OCTOPUS TENTACLES, COOKED AND COOLED

1. FRY CHICKPEAS IN A LITTLE OIL ON MEDIUM HEAT, ADDING THE GARLIC SHOOTS TOWARDS THE END.

400g CHICKPEAS, COOKED

4 GARLIC SCAPES (SHOOTS)

2. SERVE THE CHICKPEAS AND GARLIC SHOOTS ON EIGHT SEPARATE PLATES AND PLACE THIN SLICES OF OCTOPUS ON TOP.

EXTRA VIRGIN OLIVE OIL

3. SPRINKLE THE PAPRIKA, DRIZZLE A LINE OF OIL AND ADD A LITTLE COARSE SALT.

PAPRIKA 10g

+ COARSE SALT

Chef Abraham García at work in his restaurant.

sophisticated – like so many genuinely great 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.

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

SERVES 4

# Chickpea and COD STEW with SPINACH and PINE NUT FRITTERS

2 BUNCHES OF SPINACH

12 ALMONDS

OLIVE OIL

1) PLACE THE CHICKPEAS IN WARM WATER AND SOAK FOR 12 HOURS. DRAIN.

500 G DRIED CHICKPEAS

2) PLACE THE SOAKED CHICKPEAS IN A PRESSURE COOKER, COVER THEM IN WATER, THEN ADD THE VEGETABLES AND A TRICKLE OF OLIVE OIL.

50 G PINE NUTS

3) PUT THE SPINACH TO ONE SIDE, AND THEN BLEND THE OTHER VEGETABLES WITH SOME OF THE COOKING LIQUID.

BAY LEAF

1 ONION

4) PLACE THE BLENDED VEGETABLES IN A SAUCEPAN TOGETHER WITH THE CHICKPEAS AND COOK ON LOW HEAT.

SPRIGS OF FLAT-LEAF PARSLEY

5 SLICES OF BREAD

5) FRY EACH SLICE OF BREAD TOGETHER WITH THE ALMONDS AND THE SAFFRON.

1 LARGE, RIPE TOMATO

6) ONCE FRIED, GRIND THE BREAD, ALMONDS AND SAFFRON WITH A PESTLE AND MORTAR AND ADD IT TO THE SAUCEPAN.

1 LEEK

7) DRAIN THE SPINACH, ROLL IT INTO A BALL, AND THEN CHOP IT ROUGHLY.

1 G SAFFRON

2 EGGS

8) MIX THE SPINACH WITH THE BEATEN EGGS, TOASTED PINE NUTS AND CHOPPED PARSLEY.

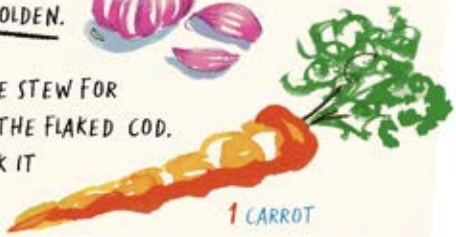
3 GARLIC CLOVES

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.

250 G FLAKED COD

+ COARSE SALT

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.



1 CARROT

The spanish chef checks on his pulses.

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 grass pea 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 lentils). This dish intuitively foreshadowed the

# MUSSELS ON A BED OF VERDINA BEANS

## With a peach and CHILLI VINAIGRETTE

Serves 8

LIME JUICE

### PREPARATION:

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, LIME JUICE, JEREZ VINEGAR, AND DIJON MUSTARD, TABASCO SAUCE AND COARSE SALT.

EXTRA VIRGIN OLIVE OIL

2 KG MUSSELS

(STEAMED OPEN AND WITH ONE SHELL REMOVED)

PICKLED GHERKINS

500 G VERDINA BEANS OR COOKED HARICOT BEANS

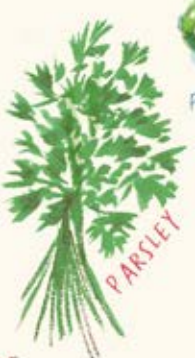
CAPERS

A FEW DROPS OF TABASCO

RED ONION

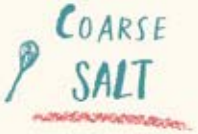
1 TEASPOON OF DIJON MUSTARD

A FEW DROPS OF JEREZ VINEGAR



PARSLEY

DRIED PEACH



COARSE SALT

Chef Abraham Garcia shares a convivial moment with his team in his restaurant, *Viridiana*.

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.

SERVES 8

# SCALLOPS WITH LENTILS AND SOBRASSADA*

## INGREDIENTS

8 LARGE SCALLOPS

1 CARROT

1 LEEK

+ SALT

1 ONION

1 MEDIUM-SIZE POTATO

2 GARLIC CLOVES

300 G LENTILS
(IF UNSHELLED, SOAK OVERNIGHT)

## 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.

50G SOBRASSADA* SAUSAGE, SKINNED

4 TASTE AND SEASON, THEN SERVE INTO EIGHT SMALL CLAY BOWLS.

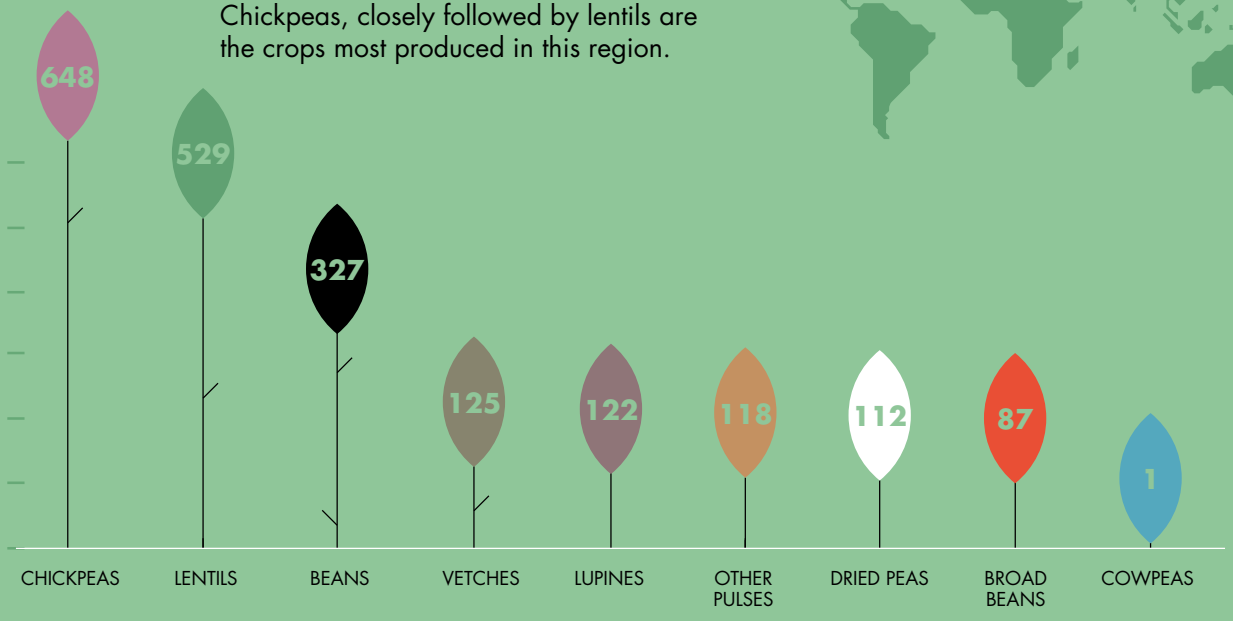
5 STEAM THE SCALLOPS, REMOVE THE MEATY PART AND PLACE ONE SCALLOP IN THE CENTRE OF EACH BOWL, ON TOP OF THE LENTIL AND SOBRASSADA PURÉE.

* SOBRASSADA IS A DELICIOUS, SOFT SAUSAGE MADE IN MAJORCA FROM PORK AND PAPRIKA

# 05 EASTERN EUROPE AND WESTERN ASIA

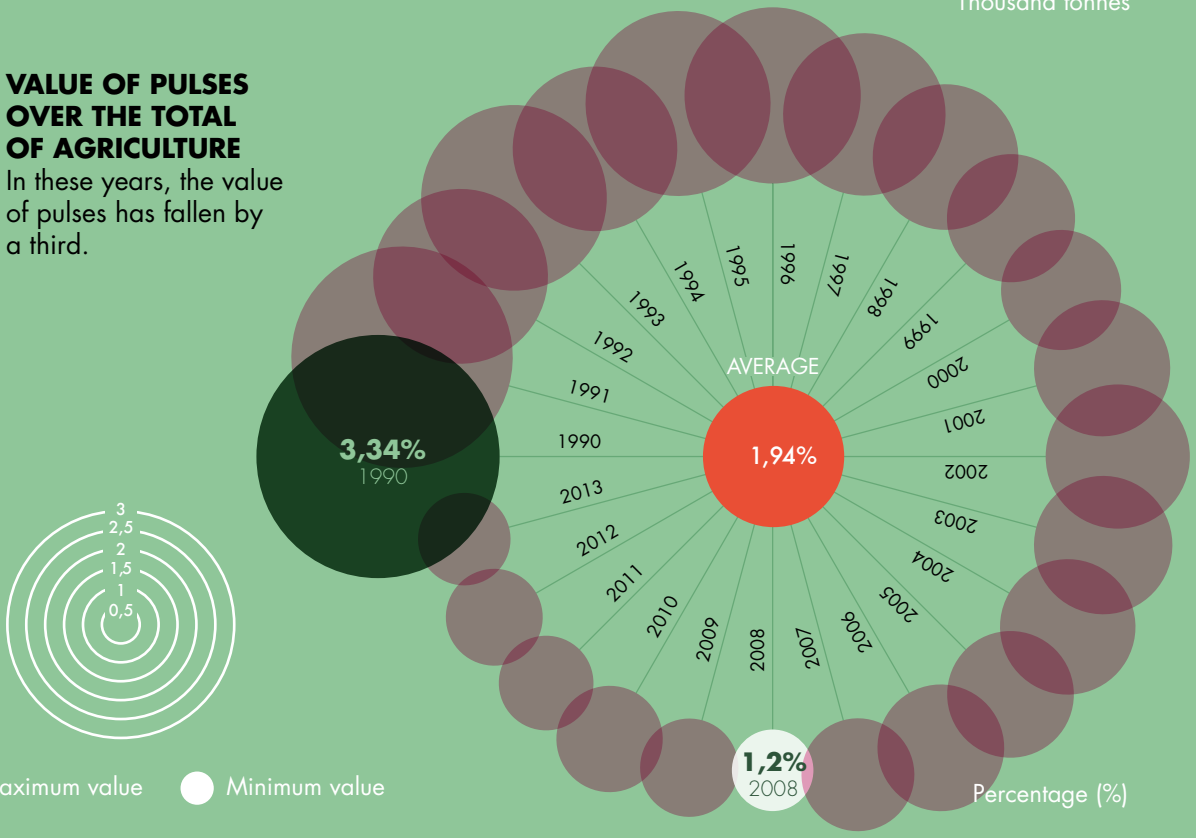
## 01 QUANTITIES PRODUCED BY TYPE OF PULSE

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.



# Eastern Europe Western and Asia

## THE HOLY PULSE

**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

**ISTANBUL (TURKEY)**

**1.** A street vendor sells traditional Turkish bagels, *simit,* outside the historical Grand Bazaar. **2.** Turkish chef Senol walking at Eminou Market in Istanbul. **3.** and **4.** A street vendor roosting chickpeas in the streets of Istanbul. **5.** Local fishermen fishing over a bridge in Istanbul. **6.** A hostess offers Turkish delight for Orient Express passengers at Sirkeci station **7.** A view at sunset of Istanbul.

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 where they subsequently spread and were 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 Israeli cuisine (and even the more rudimentary Qatari, Omani and Yemeni cuisines) share many recipes for pulses which

REUTERS/Murad Sezer

1

2

# Eastern Europe and Western Asia

REUTERS/Murad Sezer

Chef Didem Senol looking for ingredients in an organic shop in Istanbul.

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 çorbası* (lentil soup) and *tutmaç*, 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.

## CURIOSITIES

- **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, فلافل *falāfil* and Hebrew, פלאפל *faláfel*). 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*.

# Eastern Europe and Western Asia

03

## CHICKPEAS, VALUE OF PRODUCTION

In these years, the production value has decreased by a third.

**1990-2013**

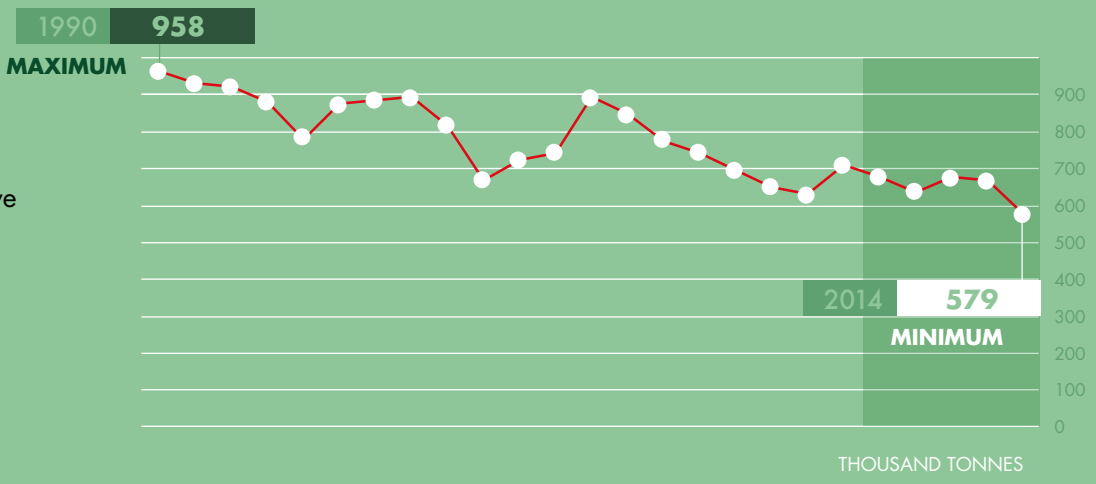
Average value
**508,21**
Million USD

04

## PRODUCTION OF CHICKPEAS

Production levels have been halved.

**2010-2014**
**648**
THOUSAND TONNES

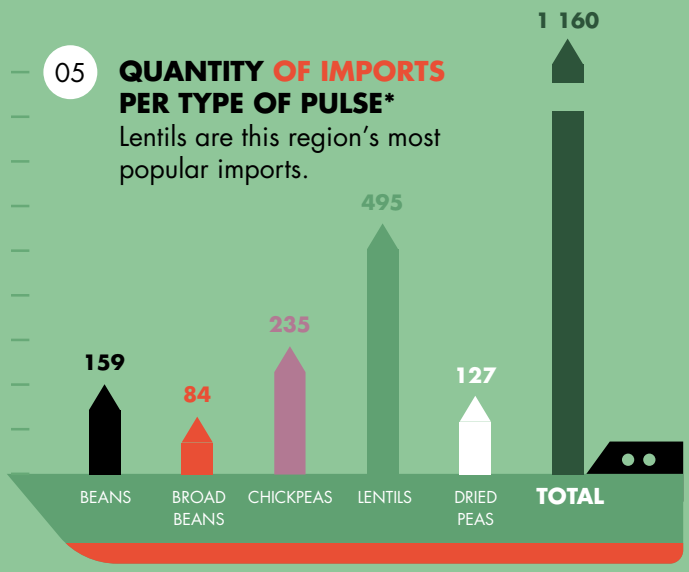



THOUSAND TONNES

05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

Lentils are this region's most popular imports.

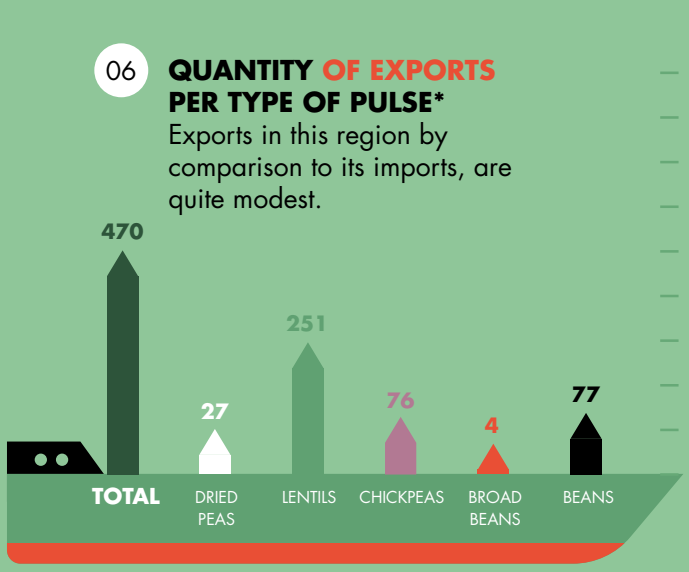



THOUSAND TONNES

06

## QUANTITY OF EXPORTS PER TYPE OF PULSE*

Exports in this region by comparison to its imports, are quite modest.




THOUSAND TONNES

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.

**ISTANBUL (TURKEY)**

Chef Didem Senol working with her team in the kitchen of *Lokanta Maya*.

# DIDEM SENOL'S DEVOTION TO PULSES

*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*. Before returning home, she gained valuable work experience at the *Eleven Madison Park* restaurant. 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

The chef shows off a handful of dried broad beans.

book, *Kızınız Defne'yi oğlumuz Iskorpit* (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-present beans, lentils, broad beans and dried peas in many home-cooked or everyday urban recipes.

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

# 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

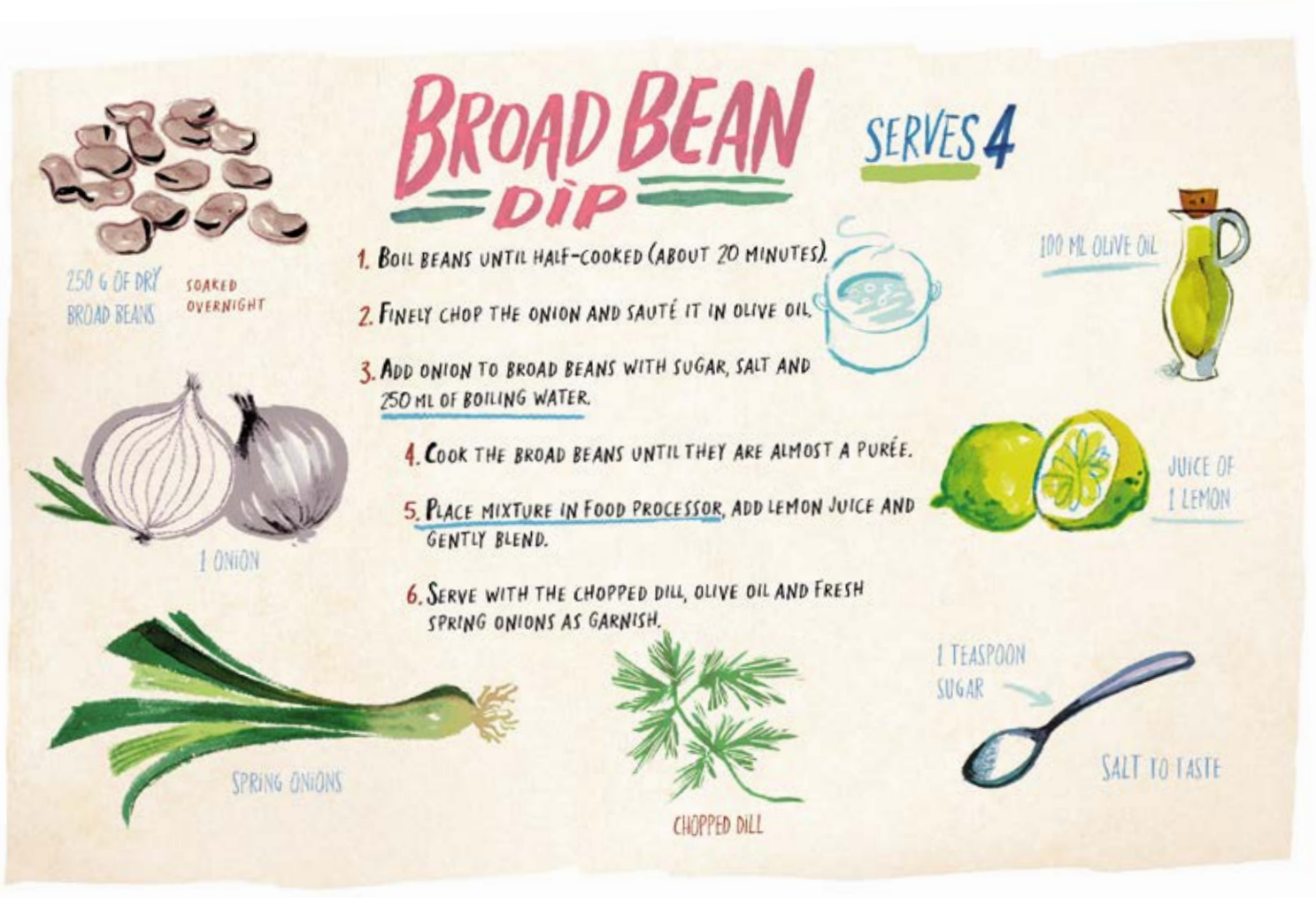
CUMIN

50 G OF BUTTER

50 G OF PISTACHIOS

100 ML OF EXTRA VIRGIN OLIVE OIL

200 G TAHINI




and 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.

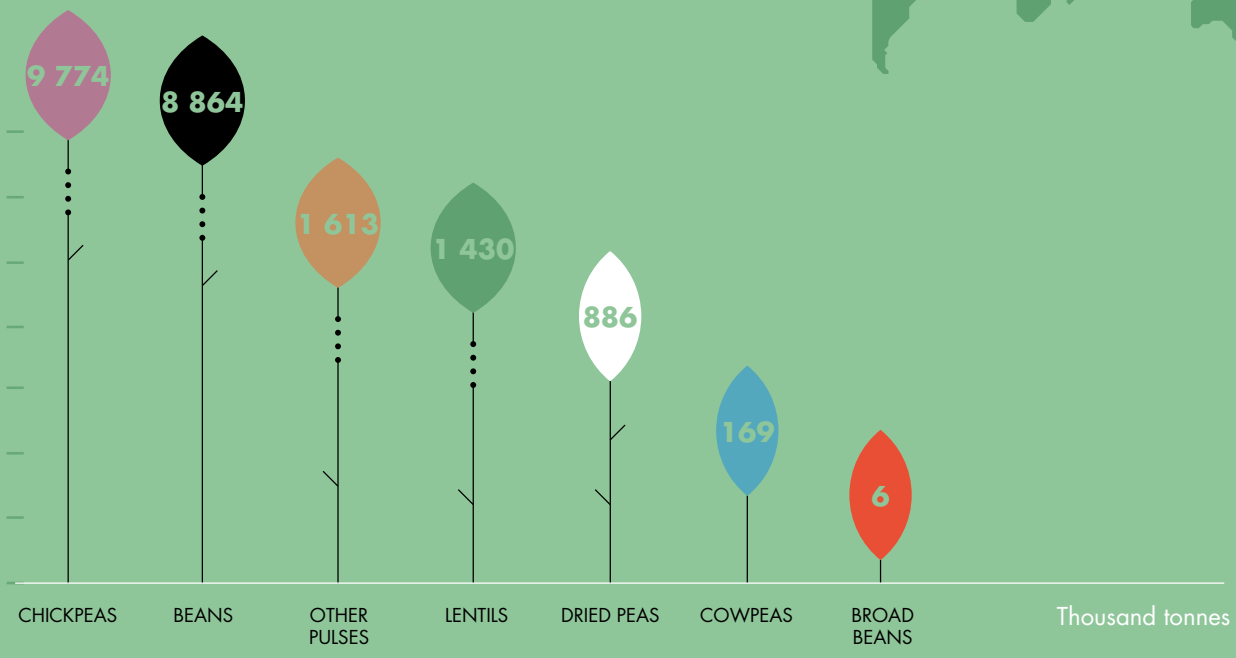
Didem Senol sources produce from all over Turkey, and she is famous for forging friendships with her suppliers. She is particularly interested in working with small producers. "Local ingredients are what define a cuisine," she often says. She visits Istanbul's food markets every day. On Wednesdays, you 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 preparing different dishes with pulses: red lentil burgers, hummus and warm salad with pistachio purslane with fried chickpeas.

# 06 SOUTH AND SOUTH EAST ASIA

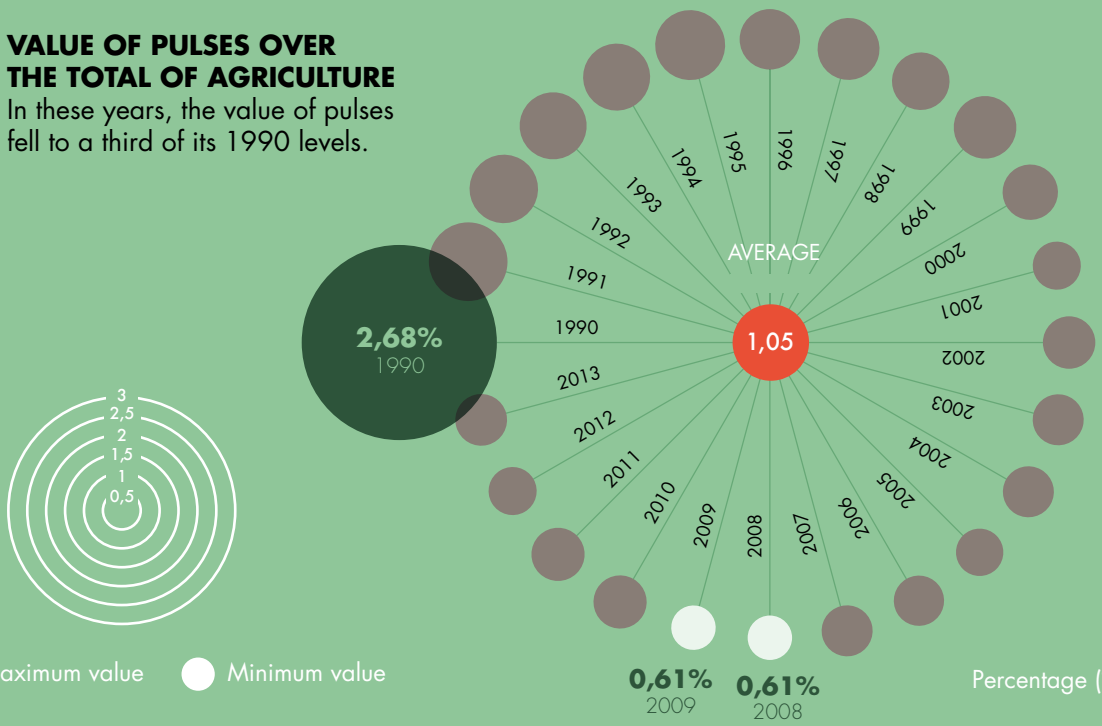
## 01 QUANTITIES PRODUCED BY TYPE OF PULSE

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.



# South and Southeast Asia

## THE ORIGIN OF THE GREAT PULSE

**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 9 500 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,

**AHMEDABAD (INDIA)**
**1.** A vendor transports food packets on his moped.
**MUMBAI (INDIA)**
**2.** Workers sort grains at APMC market. **3, 5** and **6.** Pulses on display in APMC market.
**KOLKATA (INDIA)**
**4.** A labourer carries a sack filled with pulses at a wholesale pulses market.

REUTERS/Amit Dave
1

2

3

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.

REUTERS/Rupak De Chowdhuri

4

5

6

REUTERS/Rupak De Chowdhuri

1

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 do not fall under *halal* (ie not allowed under Islamic law), pulses suffer no such prohibition. Further adding to

REUTERS/Amit Gupta

2

**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.

3

4

REUTERS/Rupak De Chowdhuri

5

REUTERS/Amit Dove

**KARACHI (PAKISTAN)**
**1.** Sacks of pulses. **2.** Mohammad Raqeeb, a local chef, cooking lentils on an open fire at a street stall. **3.** People eating chickpeas (white) at a roadside restaurant. **5.** Spices to be added to lentils are kept inside the kitchen of the Marriot Hotel in Karachi.

**MULTAN (PAKISTAN)**
**4.** Panoramic view of the fruit and vegetable market Sabzi Mandi.

**KOT CHUTTA (PAKISTAN)**
**6.** Instructor Malik Humma teaches a farmer working in the project Women Open School (WOS).

1

2

3

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 fewer than 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

# South and Southeast Asia

4

5

6

**KARACHI (PAKISTÁN)** Chef Zubaida Tariq arrives at the Empress market, famous in central Karachi for its selection of pulses.

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.

## CURIOSITIES

**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.

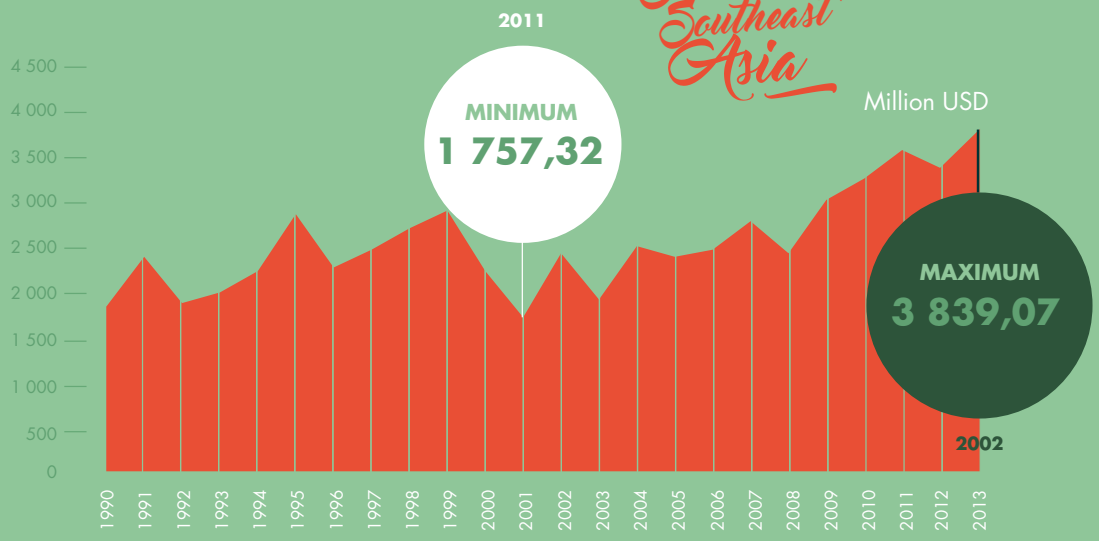
***Pindi chana* is a Pakistani speciality in which chickpeas are the main ingredient.** Hot and spicy, the dish originates from the city of Rawalpindi, in the heart of Punjab, and has been enjoyed long before the partitioning of India and Pakistan. It is not surprising that it has become a very popular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

South and Southeast Asia

03

## CHICKPEAS, VALUE OF PRODUCTION

Value of production has doubled from 2002 to 2013.




1990-2013

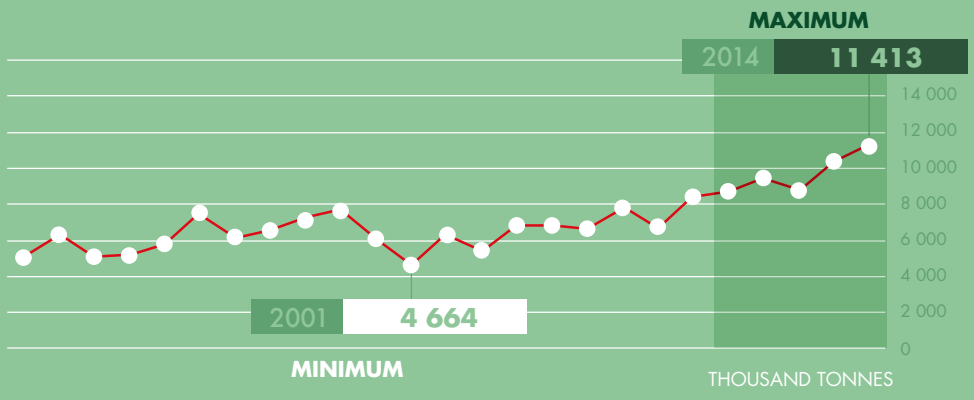
**1990-2013**
**Average value**
**1 815,73**
Million USD

04

## PRODUCTION OF CHICKPEAS

Production has tripled in 15 years and is set to further increase.

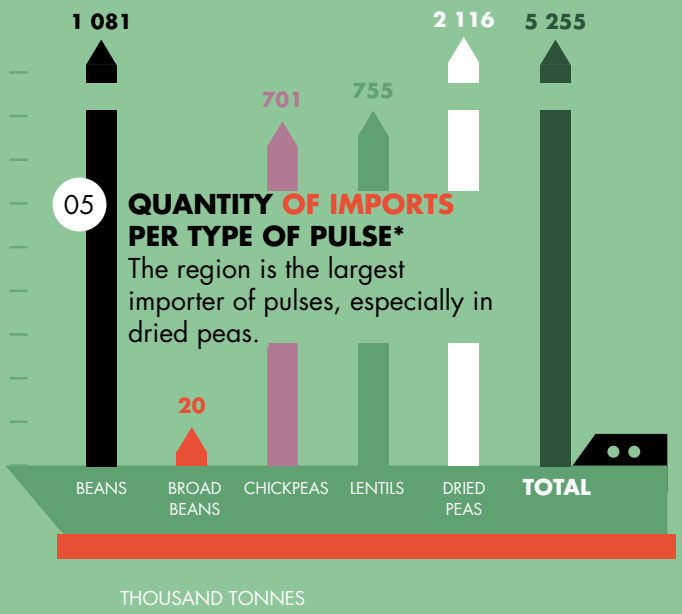
2010-2014
**9 774**
THOUSAND TONNES




05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

The region is the largest importer of pulses, especially in dried peas.




06

## 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.*

## FROM INDIA TO THE WORLD

# SANJEEV KAPOOR, IN THE LAND OF THE DAALS

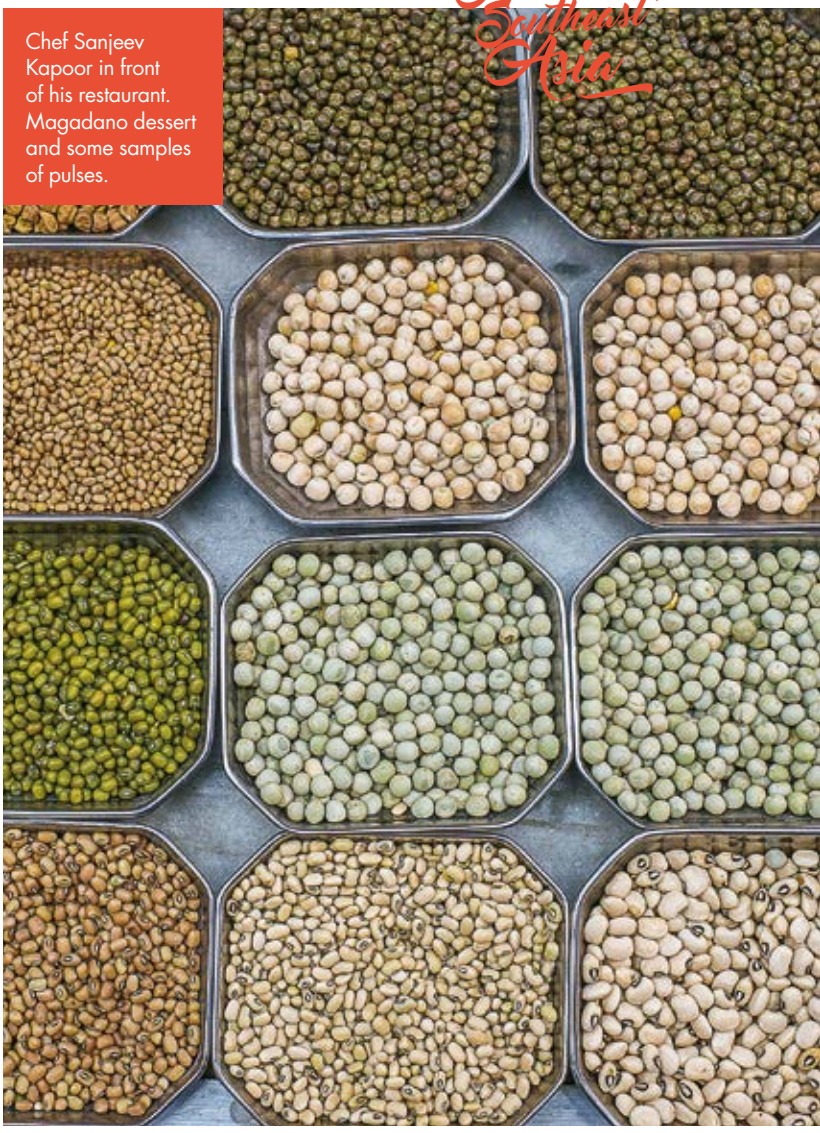
It is impossible to understand the world of dried pulses without India. It is the world's largest producer of chickpeas, a leading producer of lentils and beans, and it has a massive population that treats pulses as an everyday staple food. Add to this its rich culinary past and present, as complex as 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: Bahrain, Bangladesh, Gabon, Jordan, Kuwait, Oman, Qatar, Saudi Arabia, UAE 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 2 000 episodes and is broadcasted 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. 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



Chef Sanjeev Kapoor in front of his restaurant. Magadano dessert and some samples of pulses.

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."

STARTER

# TEEN DAL KE DAI BHALLE

SERVES 4

PREPARATION TIME : 11-15 MINUTES
COOK TIME : 16-20 MINUTES

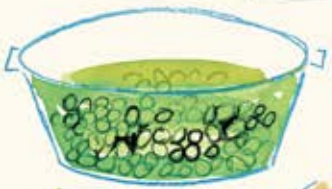
## INGREDIENTS:

GREEN CHILLI PASTE
1/2 TABLESPOON

SPLIT GREEN GRAM SKINLESS (DHULI MOONG DAL) SOAKED
1/2 CUP

## PREPARATION

1) DRAIN AND GRIND THE 3 DALS WITH VERY LITTLE WATER TO A FINE PASTE. TRANSFER INTO A BOWL.



SPLIT GREEN GRAM SKINLESS (DHULI MOONG DAL) SOAKED
1/2 CUP

SPLIT BENGAL GRAM (CHANA DAL) SOAKED
2 TABLESPOONS

2) HEAT SUFFICIENT OIL IN A KADAI (DEEP COOKING POT). 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.

OIL TO DEEP FRY

RED CHILLI POWDER
1/2 TEASPOON

4) DRAIN AND SOAK IN WATER FOR 10 MINUTES. DRAIN THE BHALLE AND SQUEEZE OUT EXTRA WATER AND ARRANGE THEM ON A SERVING PLATTER.

5) POUR CHILLED YOGHURT OVER THEM AND SERVE SPRINKLED WITH BLACK SALT, RED CHILLI POWDER, CUMIN POWDER, DATE AND TAMARIND CHUTNEY AND CORIANDER LEAVES.

+ SALT TO TASTE

BLACK SALT (KALA NAMAK)
1/2 TEASPOON

YOGHURT WHISKED AND CHILLED
2 1/2 CUPS

SWEET DATE AND TAMARIND CHUTNEY
1/2 CUP

FRESH CORIANDER LEAVE CHOPPED: 1/2 CUP

ROASTED CUMIN POWDER
1 TEASPOON

6) SERVE CHILLED.

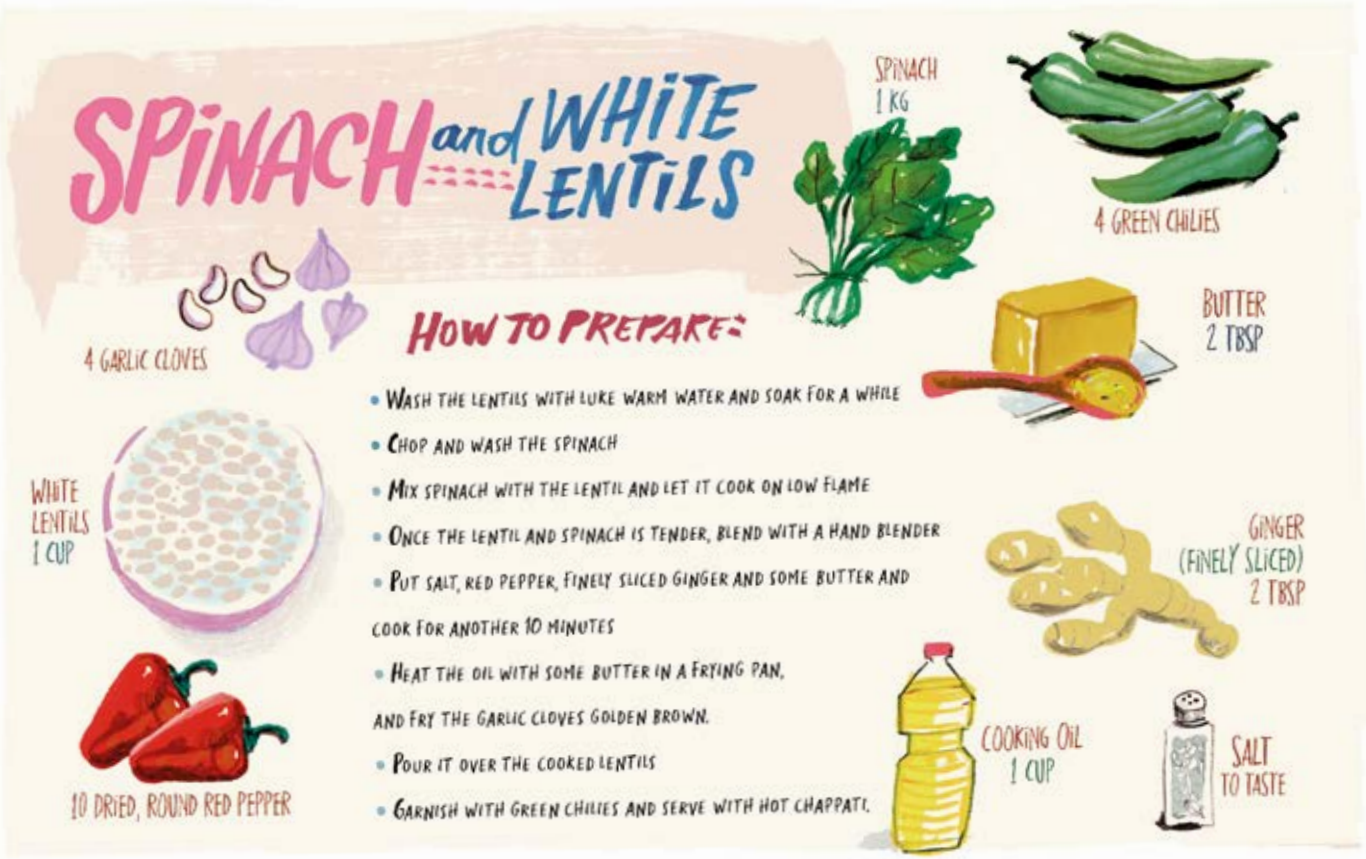
**KARACHI (PAKISTÁN)**
Chef Zubaida Tariq in her home.

# ZUBAIDA TARIQ, PULSES TRIED AND TRUE

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 Maharastra, 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.

Chef Tariq arrives at the Empress market.



Chef Zubaida Tariq preparing and mixing ingredients with pulses.

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 ingredients, such as the country's ever-present pulses. Her popular recipe books, including her take on dishes such as the national favourite

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.

*daal masala*, are highly influential in home cooking throughout Pakistan. Through her tried and true recipes, regional specialities have made their way 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, nutritious 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 find 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 sub-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

PINK LENTILS,
YELLOW LENTILS
1/2 CUP EACH



PIGEON PEAS 1 TBSP

## BRAISING

1 ONION (FINELY SLICED)

6 DRIED, ROUND RED CHILIES

GARLIC (4 CLOVES FINELY CHOPPED)

CUMIN SEEDS (1 TSP)

OIL (1/4 CUP)

GINGER /
GARLIC PASTE
1 TBSP

TURMERIC POWDER
1 TSP

HOT WATER
2 CUPS

GINGER
(FINELY CUT)
2 TBSP

RED CHILI POWDER
1 TSP

- SOAK ALL LENTILS FOR 2 HOURS
- THEN BOIL WITH TURMERIC POWDER, RED CHILLI 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.

GREEN CHILIES
(FINELY CUT)
4 PCS

GRAM LENTILS AND WHITE LENTILS
1 TBSP EACH

BUTTER
2 TBSP

RAW MANGO
(FINELY CUT)
1 SMALL

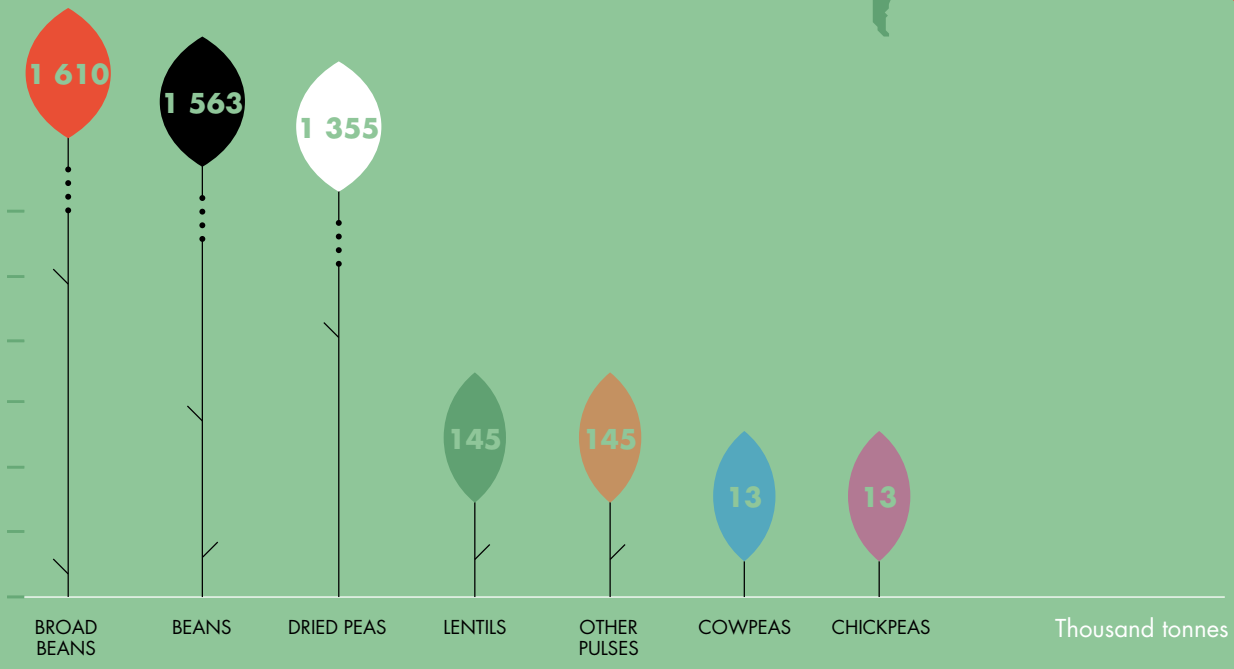
DRIED MANGO
6 PCS

SALT
TO TASTE

# 07 THE FAR EAST AND THE PACIFIC

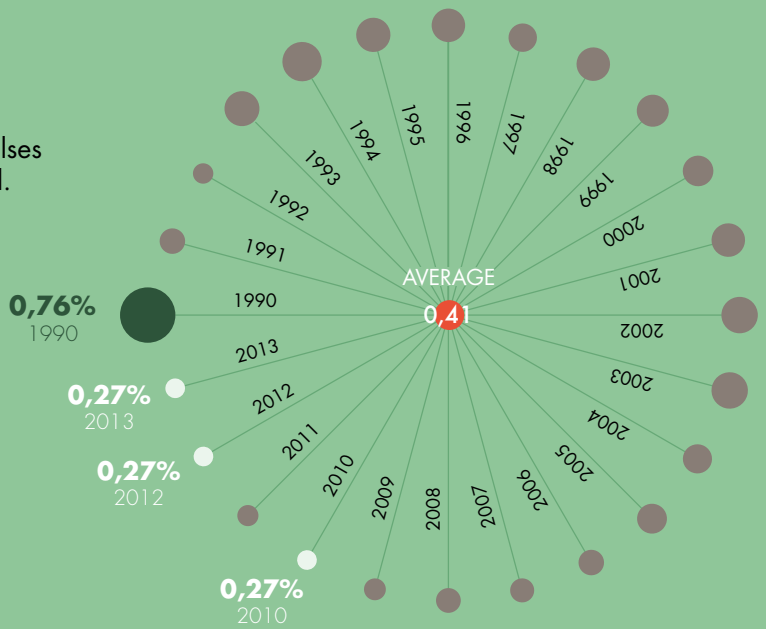
## 01 QUANTITY PRODUCED BY TYPE OF PULSE

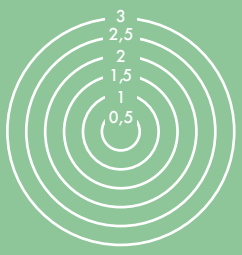
Broad beans, dried peas and beans are the top pulses produced in this region.




## 02 VALUE OF PULSES OVER TOTAL AGRICULTURE

In these years, the value of pulses shrank to just one third overall.




Maximum value  Minimum value

Percentage (%)

# The Far East and the Pacific

## FEEDING BILLIONS OF MOUTHS IN THE YEARS TO COME

**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, the prominence of which in the region has been immense in countries like China, Japan, Republic of Korea (South Korea) and Taiwan. 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 *Phaseolus* beans are not produced or

1 The **FAO** does not consider species used for oil extraction, like soya beans, to be a pulse.

1

3

2

4

5

**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.

6

7

consumed in the Far East 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.

Japan, South Korea and Taiwan consume large quantities of dried mung beans and black gram (also of the genus *Vigna*), used in a wealth of traditional dishes. This may in part be due to 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 Papua 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 *kwa¯ti* soup, eaten during the *Gun Punhi* festival and made from no fewer than nine types of pulse; some dried and others fresh, including chickpeas,

**BEIJING (CHINA)**
Market seller handling celery stalks.

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 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.

## 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.

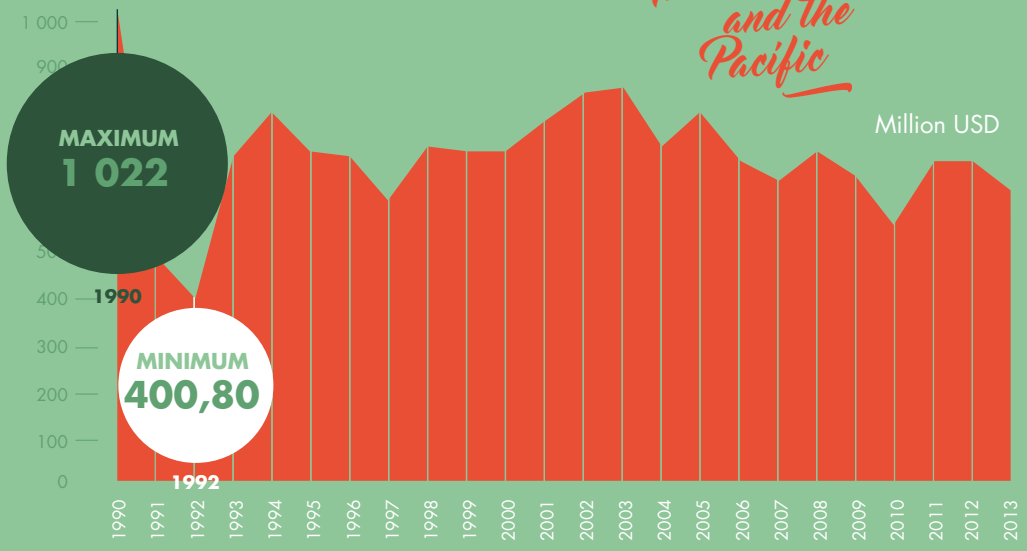
03

## BROAD BEAN, VALUE OF PRODUCTION

Production value has fluctuated greatly over the years.

**1990-2013**

Average value
**705,71**
Million USD




04

## PRODUCTION OF BROAD BEAN

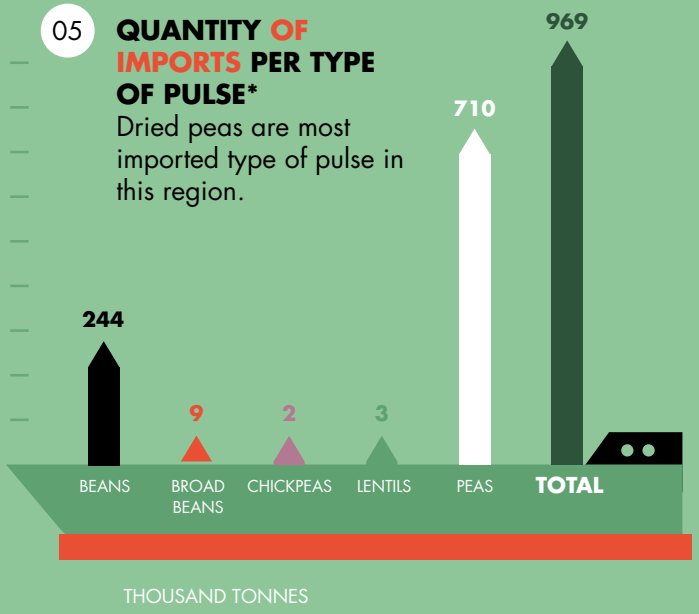
Fluctuating in the early 1990s, production levels have stabilised in recent years.

**2010-2014**
**1 562**
THOUSAND TONNES

05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

Dried peas are most imported type of pulse in this region.




06

## 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.

# SHE ZENGTAI, TIME TRAVELLER

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

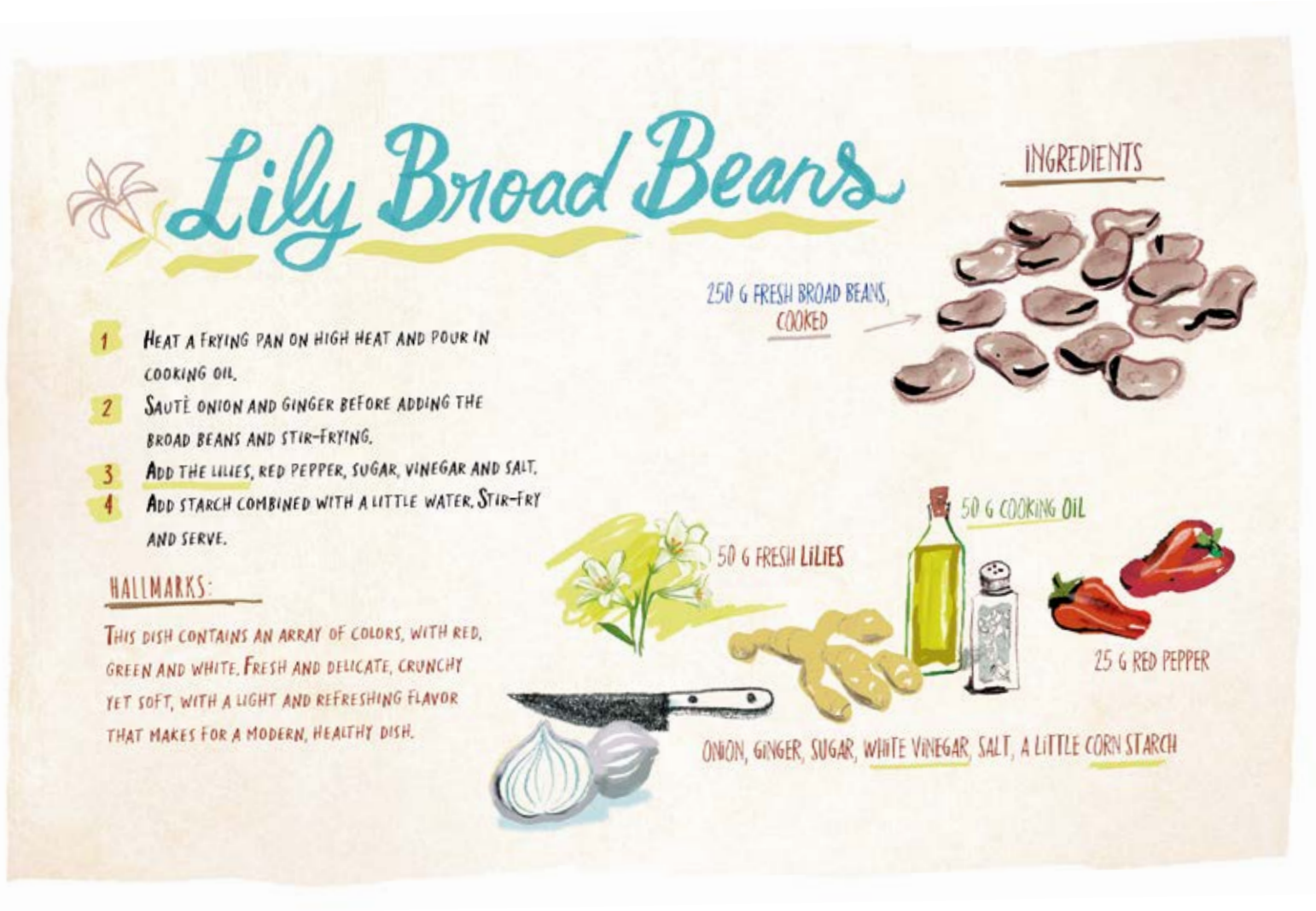
Chef She at work as his wife looks on.

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 cooks, 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 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

Chef She making bean roulade.




pulses from 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 chef She, who, in addition to being a renowned cook is an expert in traditional Chinese medicinal foods.

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."

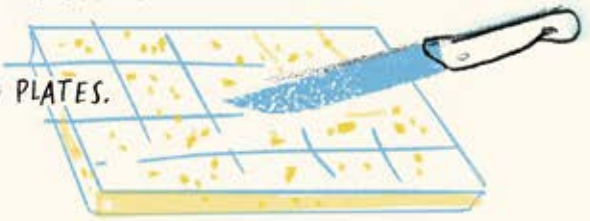
# Yellow Split Pea Pudding

## 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.
6. Wait until the mixture has completely cooled before
   turning it out onto a chopping board,
   cutting into block and transferring to plates.



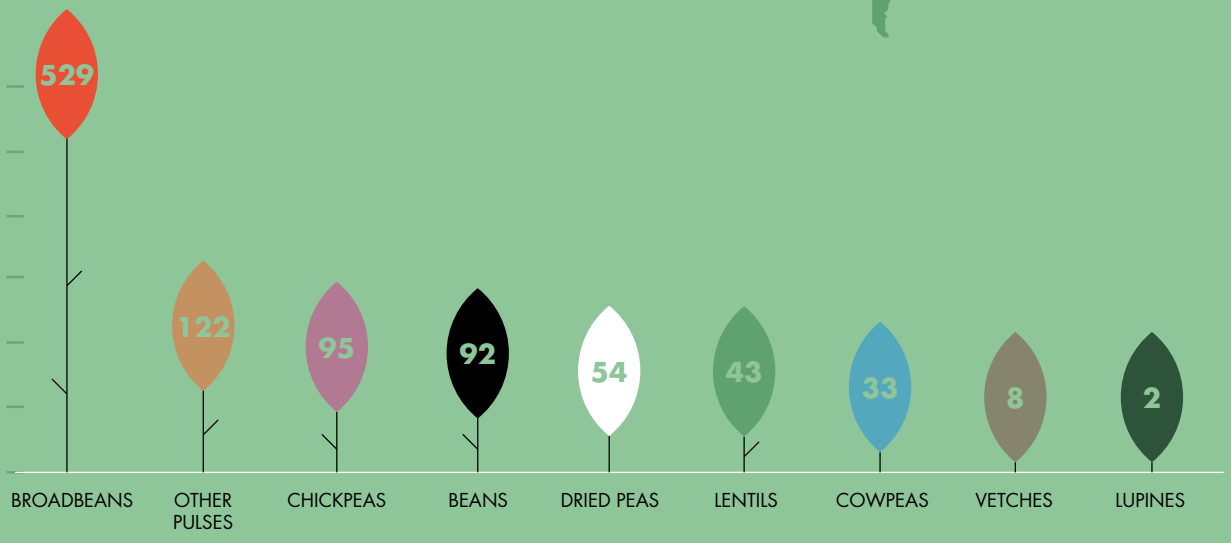
## Hallmarks:

The pudding's yellow color and the rich, pleasing flavor of the peas made this dish a wellknown "royal favorite" of the Qing Dynasty.

# 08 NORTH OF AFRICA

## 01 QUANTITIES PRODUCED BY TYPE OF PULSE (AVERAGE 2010 - 2013)

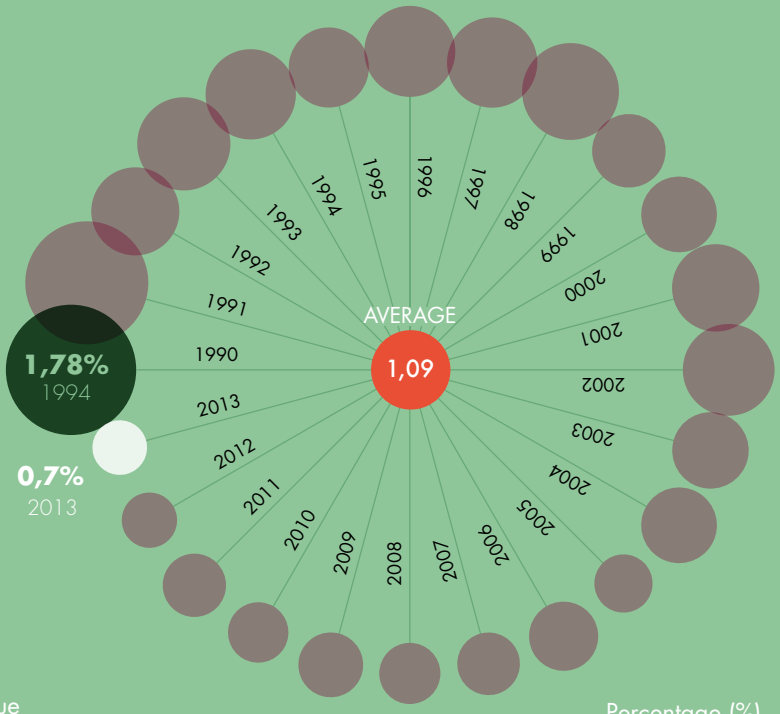
Broad beans is North Africa's top crop.

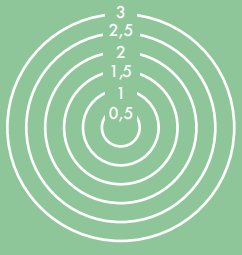



Thousand tonnes

## 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.




Maximum value  Minimum value

Percentage (%)

# North Africa

## PULSES AND THE SANDS OF TIME

**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

1

2

**MARRAKESH (MOROCCO)**
At Mellah market: **1.** Sacks of dried pulses **3.** Sack of dried split green peas. **4.** Dried and tinned goods shop. **5.** Fishmonger. **6.** Fresh Fava Beans. **7.** Dried white beans. **2.** Orange juice stall. Djema el Fna, a UNESCO World heritage Site.

3

4

أسماك سوق الخير
عندشمشام مصطفى
الشريف بوغالب
LES POISSONS SOUK LE KHAIR
Chez Chemcham Mustapha
Cherif BOUGHALEB
N° 19
GSM : 06 62 60 47 75

5

6

7

Chef Mohamed Fedal with his Gardener, in Riat near Marrakesh.

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*a 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, dried 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.

## CURIOSITIES

**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.

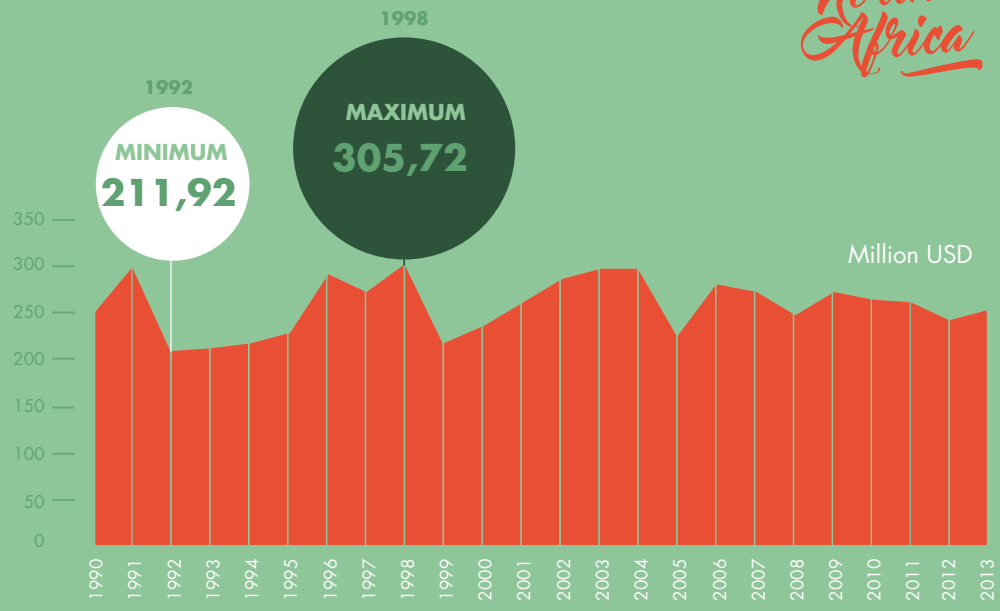
**While seasoning and spices are employed to silence** (so to speak) some of the effects of pulses, some professional chefs in North Africa also try to ensure they are easily digestible by way of preparation. Starting with discarding the water they're soaked in, but also the water they are first boiled 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**

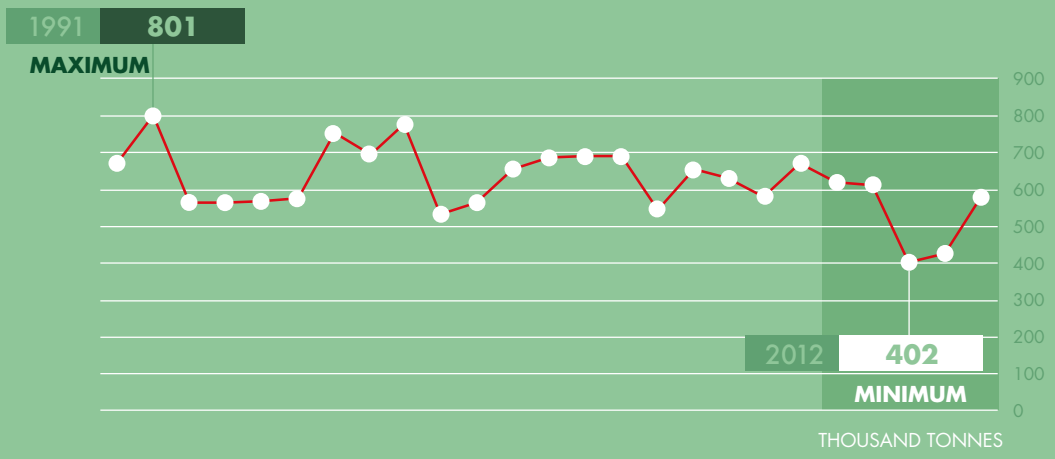
**271.89**

Million USD

04

## PRODUCTION OF BROAD BEANS

In general, production has decreased in these years.




2010-2014

**528**

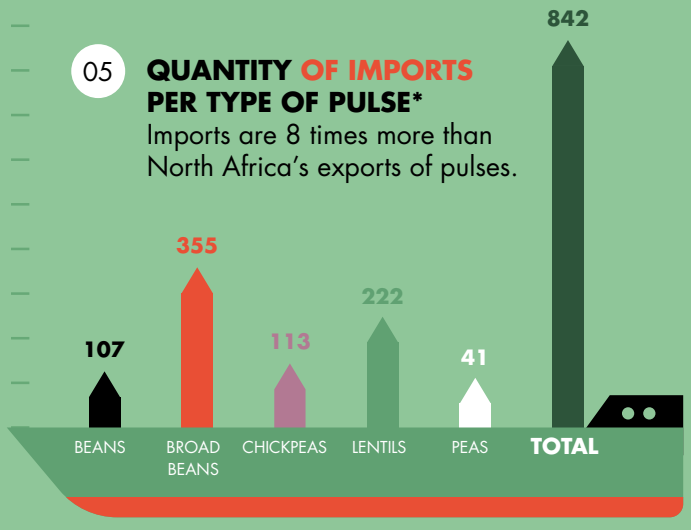
THOUSAND TONNES

THOUSAND TONNES

05

## QUANTITY OF IMPORTS PER TYPE OF PULSE*

Imports are 8 times more than North Africa's exports of pulses.




THOUSAND TONNES

06

## QUANTITY OF EXPORTS PER TYPE OF PULSE*

North Africa exports a very modest quantity of pulses.

THOUSAND TONNES

* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.

**MARRAKESH, (MOROCCO)**
Chef Mohamed Fedal. NEXT PAGE: Selecting legumes at the Mellah market.

## A PROPHET OF PULSES

# MOHA AND THE JEWELS OF THE TAGINE

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, where he returned to the fundamentals of

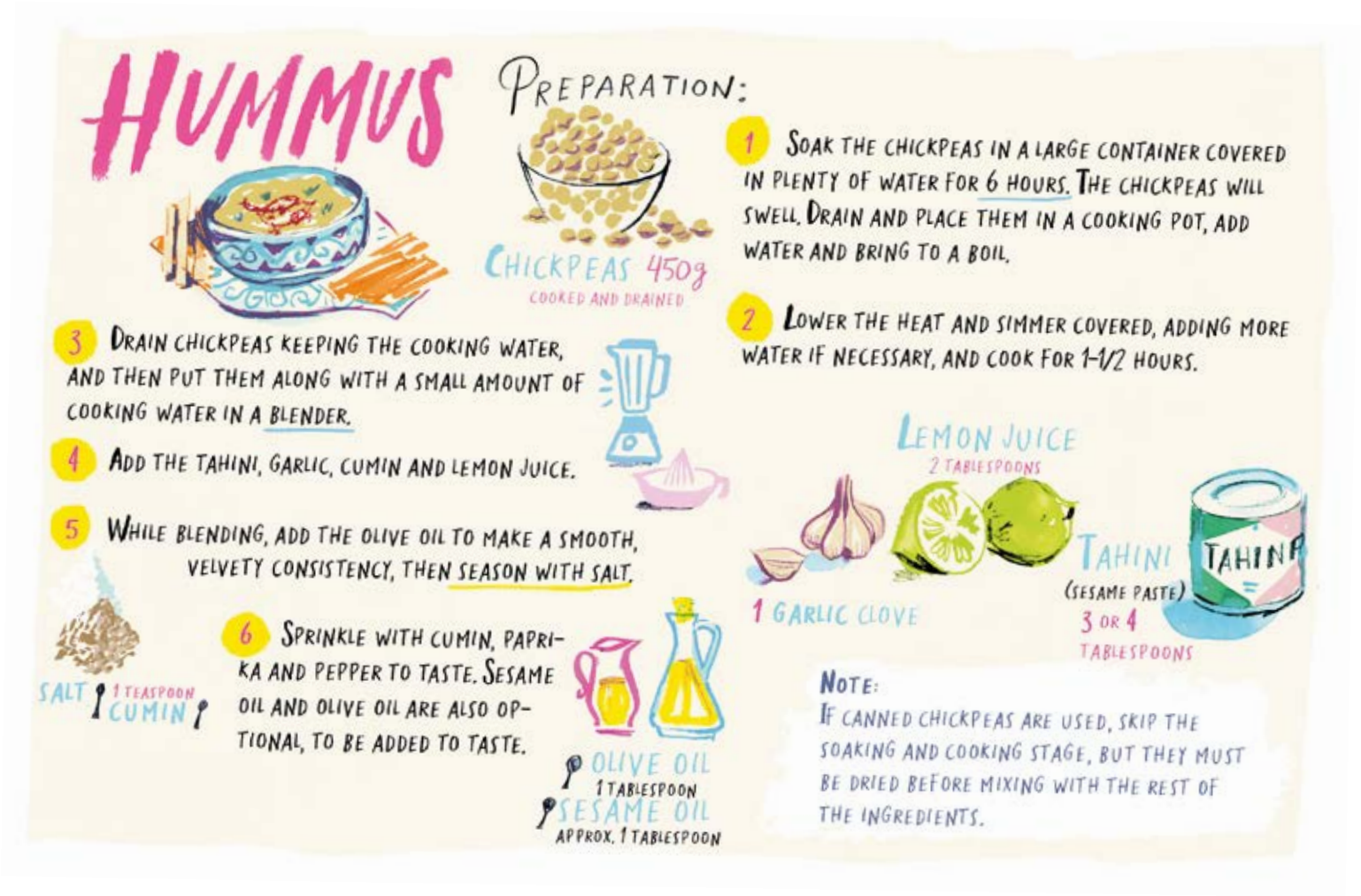
traditional Moroccan cuisine. While adding some innovative touches to his dishes, he set out to earn Intangible Cultural Heritage status for his country's culinary traditions.

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."

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

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 French Academy of 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

SERVES 6

## PREPARATION:

150 G LENTILS

150 G CHICKPEAS

150 G DRY BROAD BEANS

1. SOAK THE DRY BROAD BEANS, CHICKPEAS AND LENTILS FOR EIGHT HOURS.

1 GRATED ONION

GINGER GRATED TO TASTE

2. DRAIN AND PLACE THEM IN A SAUCEPAN WITH GRATED ONION, PEPPER, GINGER, TURMERIC, CINNAMON, CORIANDER, CELERY AND OIL.

OLIVE OIL

2 TABLESPOONS

APPROX. 3 LITRES WATER

3. COVER WITH HALF THE WATER AND BRING TO A BOIL.

TURMERIC GRATED TO TASTE

500 G CHOPPED TOMATOES

TOMATO CONCENTRATE

2 TABLESPOONS

1/2 STICK CELERY, CHOPPED

4. REDUCE HEAT AND SIMMER FOR 15 MINUTES.

4 SPRIGS FRESH CORIANDER

5. ADD THE CHOPPED TOMATOES AND TOMATO CONCENTRATE AND THEN ADD ENOUGH WATER TO COVER WELL AND COOK FOR ANOTHER 30 MINUTES.

1 STICK CINNAMON

150 G FLOUR

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.

50 G RICE

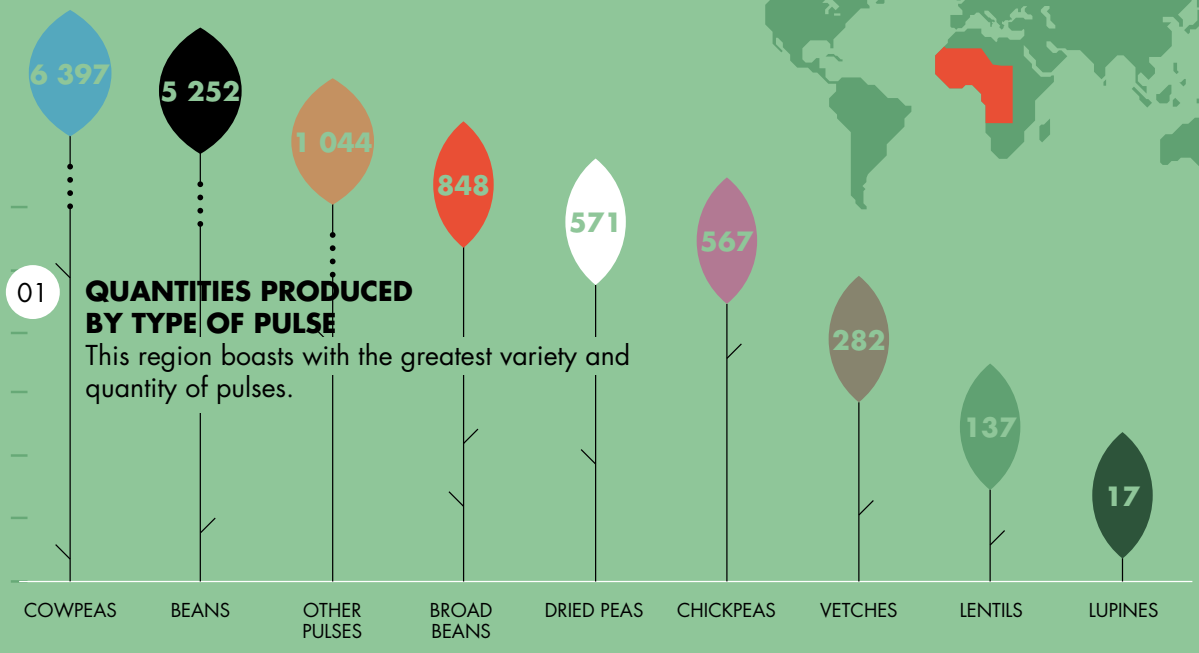
50 G NOODLES

1 TEASPOON PEPPER

SALT TO TASTE

7. SEASON WITH SALT, LEAVE TO STAND AND SERVE OVER RICE OR NOODLES.

# 09 WESTERN AND CENTRAL AFRICA

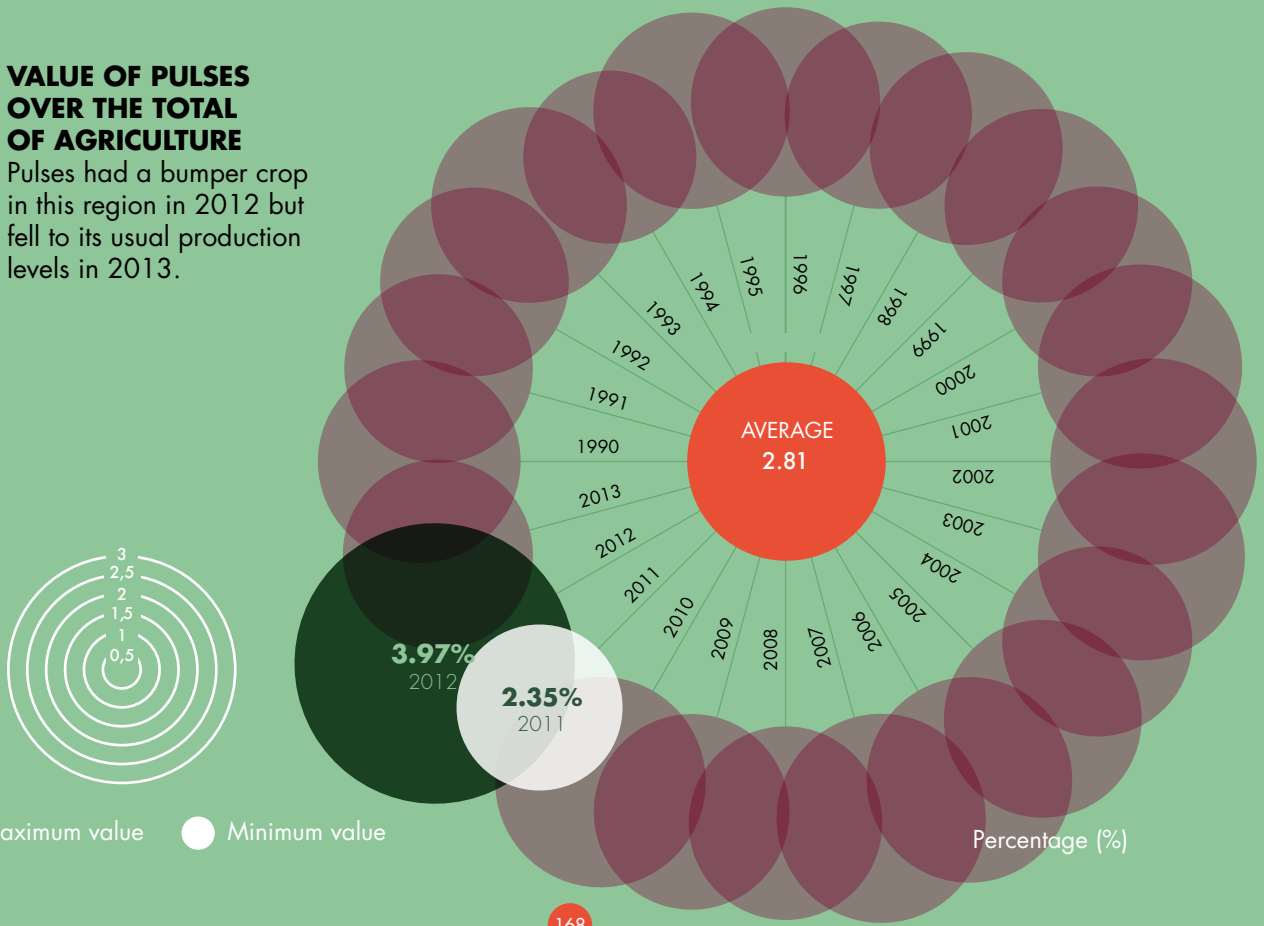


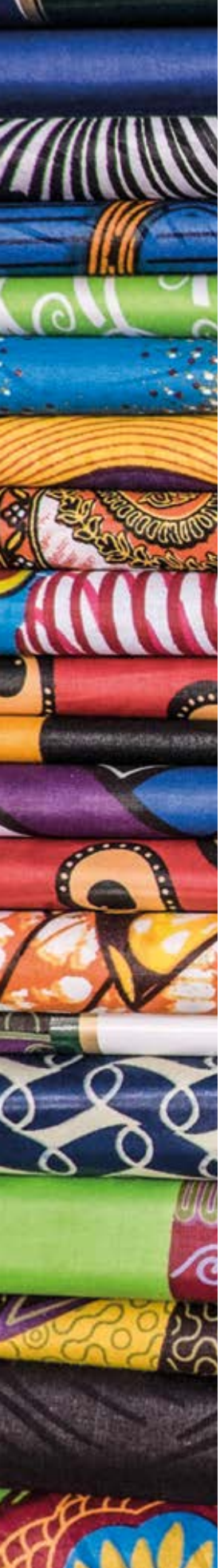

01 **QUANTITIES PRODUCED BY TYPE OF PULSE**

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

02 **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.





# Western and Central Africa

## FOOD IN THE CRADLE OF AFRICA

**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

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.

kingdoms, 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)**
People shopping in the market of Grand Dakar.

ADJA
ADJA
ADJA
ADJA
ADJA
BOUILLON CREVETTE

**DAKAR (SENEGAL)**

**1.** A woman buys wax print fabric at the Grand Dakar market. **2.** Employee cooking beans in a food stall. **3.** Washing beans prior to cooking. **4.** Beans simmering in a sauce. **5.** Children shopping at the Grand Dakar market. **6.** Bassirou Gueye making a bean sandwich. **7.** Daba Diop making an egg and bean sandwich for customers. **8.** Bassirou Gueye pouring coffee for customers.

MAI
2015
ADJA
EUROVIA

**DAKAR (SENEGAL)**
Haricot beans imported from France in the Grand Dakar market.

a side dish, in sauces or stews. One such pulse is peanuts, which are not often classified as such, used in *moambe*, *bambara* and *ndolé*. Rice and bean dishes are also common in local cuisine, such as Congolese *loso na madesu*, which goes by the name of *waakye* in its Ghanaian variant.

It is within this context that the predominantly agricultural country of Mali has become increasingly interested in dried pulses as a necessary foodstuff, increasing its production of pulses over the past decade. Although cereals are still the main crop in Mali, these of course have to be supplemented with dairy products or, more 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.

## CURIOSITIES

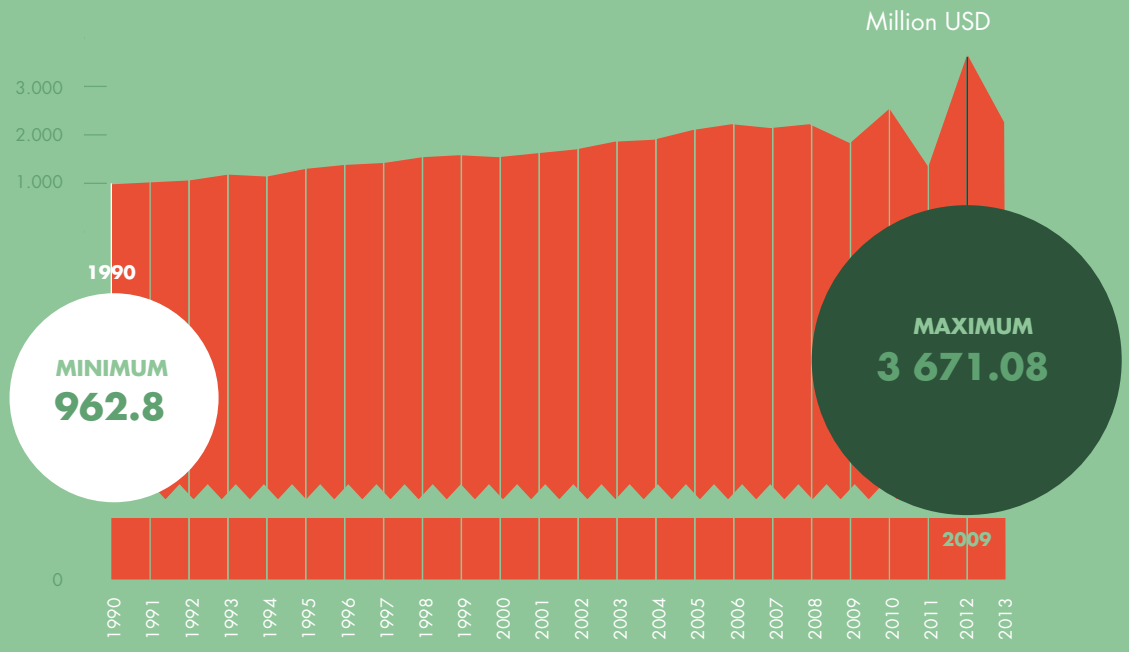
- **Senegal cooking includes black-eyed peas, lentil stews, and *ndambé***, a sandwich made from stewed beans in a very spicy tomato sauce – served up for breakfast.
- **Nigeria is Africa's largest country by population and one of the world's largest producers of pulses.** Nigerian cuisine features a number of dishes that include beans, such as the *pudding moimoi* (called *tubaani* in Ghana) and *acarajé* 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 *red-red 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.

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

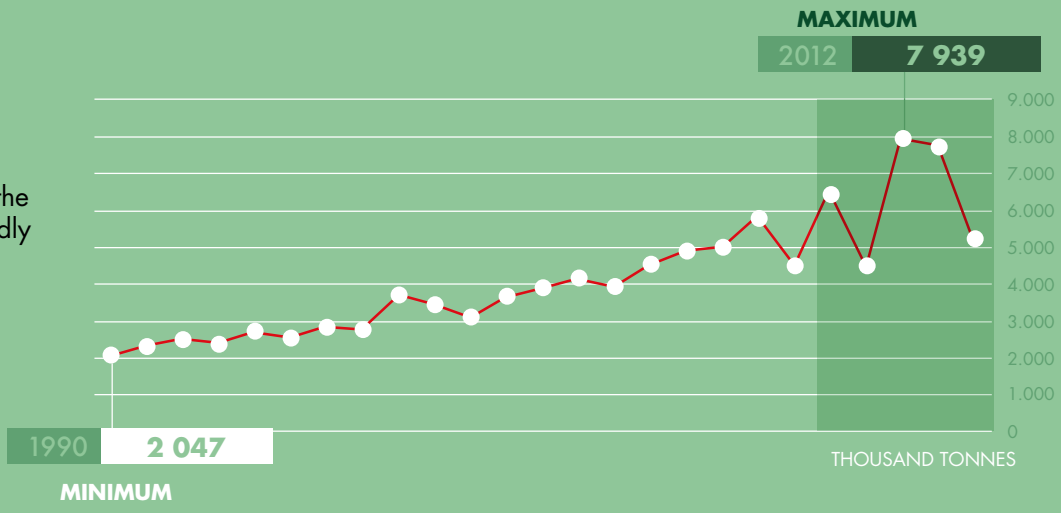



04

## PRODUCTION OF BEANS

Increasing steadily over the years and fluctuating wildly from 2012 to 2014.

**2010-2014**
**6 396**
THOUSAND TONNES




05

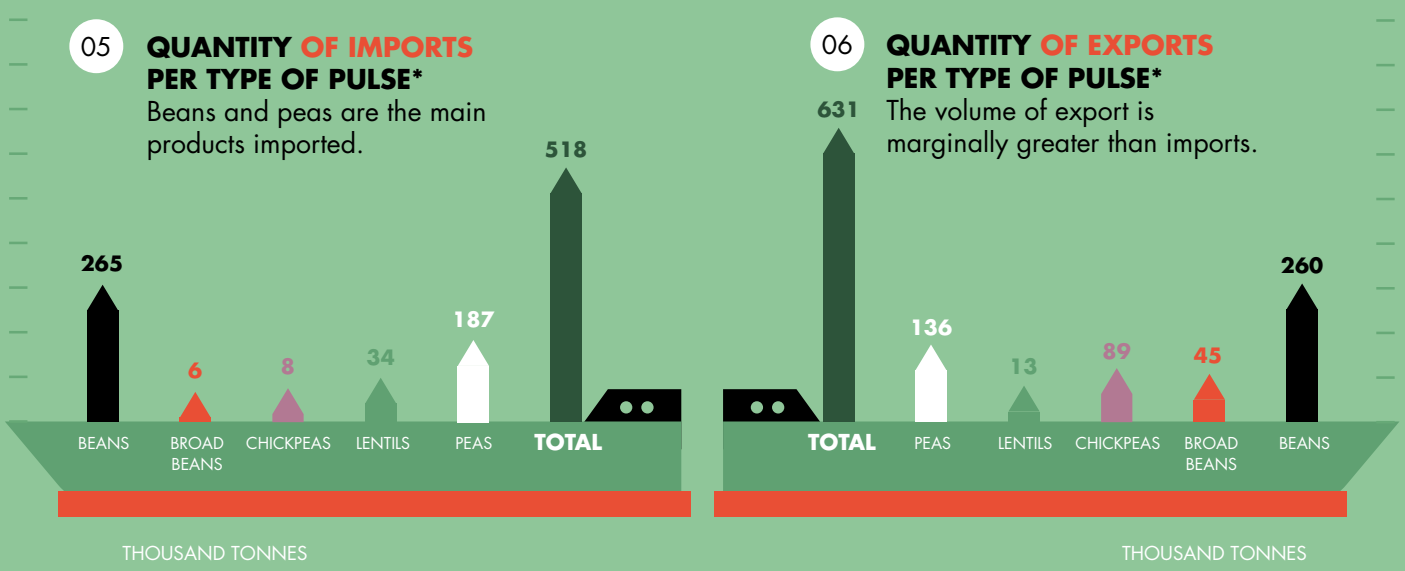
## QUANTITY OF IMPORTS PER TYPE OF PULSE*

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.

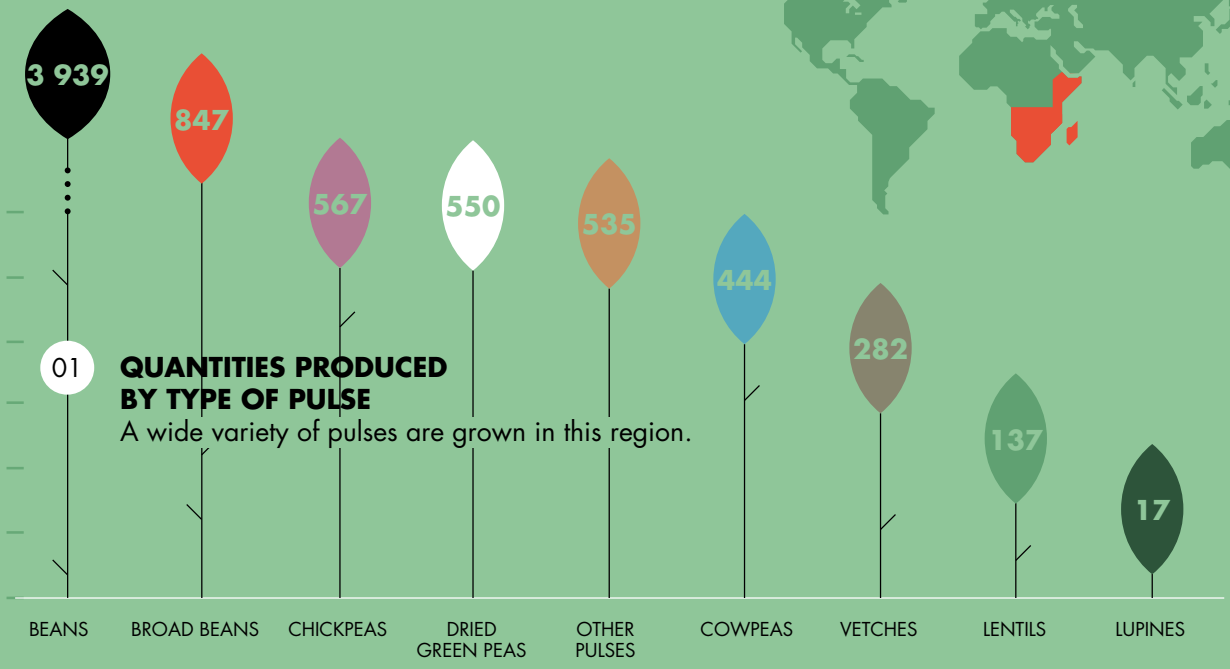



* Average 2009-2013.
The figure for total exports and imports include other pulses that are not listed.

# 10 EAST AND SOUTHERN AFRICA

## 01 QUANTITIES PRODUCED BY TYPE OF PULSE

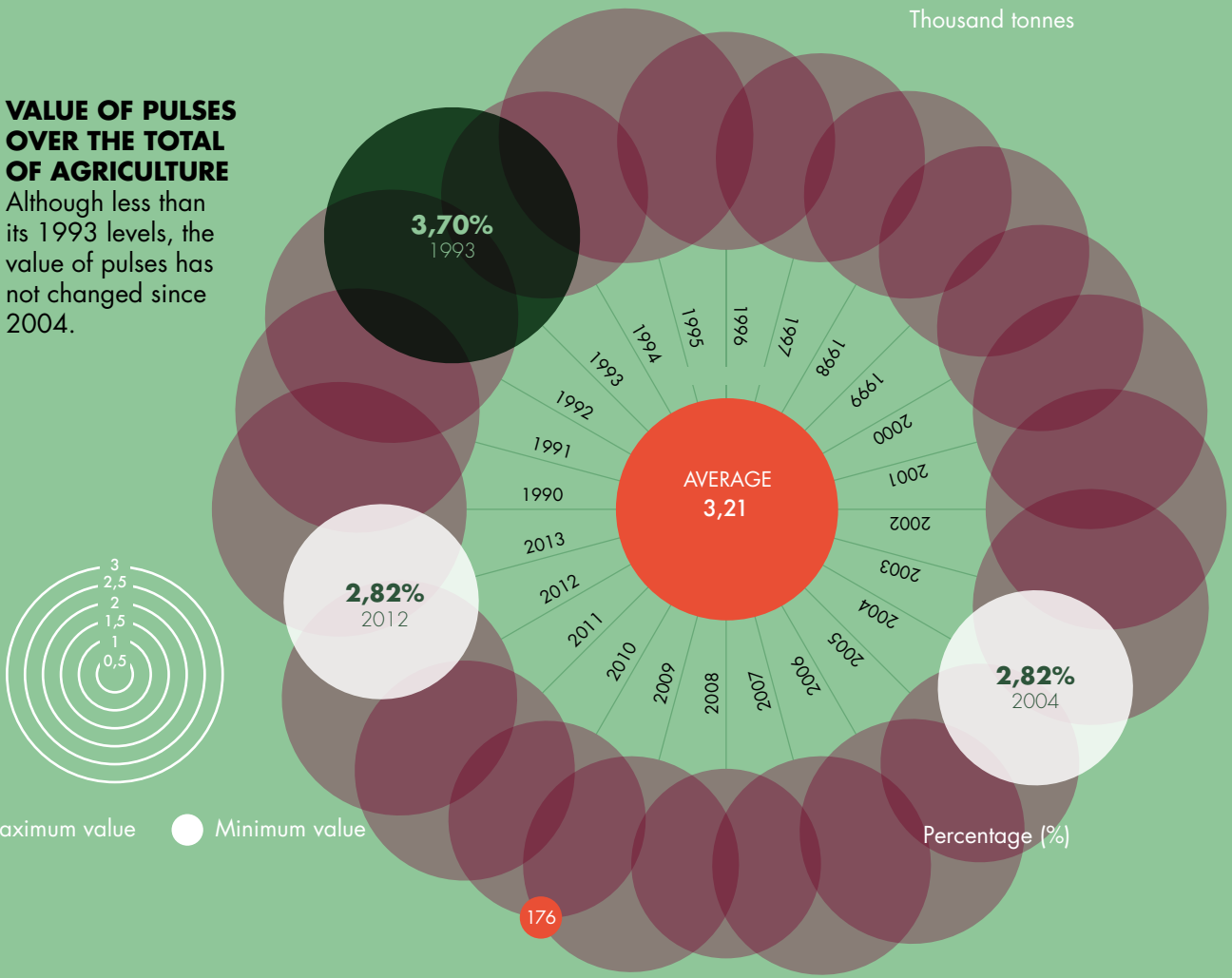
A wide variety of pulses are grown in this region.




Thousand tonnes

## 02 VALUE OF PULSES OVER THE TOTAL OF AGRICULTURE

Although less than its 1993 levels, the value of pulses has not changed since 2004.



# East and southern Africa

## THE JOURNEY OF PULSES TO THE CRADLE OF HUMANITY

**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 foraging 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

1
2

3

4

5

**KARATU (TANZANIA)**
**1. 3.** and **4.** Selection of different pulses in the market.
**2.** Chef Veronica Jackson shopping for pulses at the market.
**5.** Pulses growing at the Kitela Lodge farmstead.

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 *lablabs* (*njahi* in the Kikuyu language). In Rwanda, beans are usually cooked in large pots and stored in a variety 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 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 its fair share of specialities using pulses to African cuisine, such as the hard-to-pronounce Bantu dish, *umngqusho*. The *xhosa* variation was Nelson Mandela's favourite recipe. Influenced by European and

The hand of Chef Jackson with a handful of peas at the Karatu market.

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 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.

## CURIOSITIES

**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.

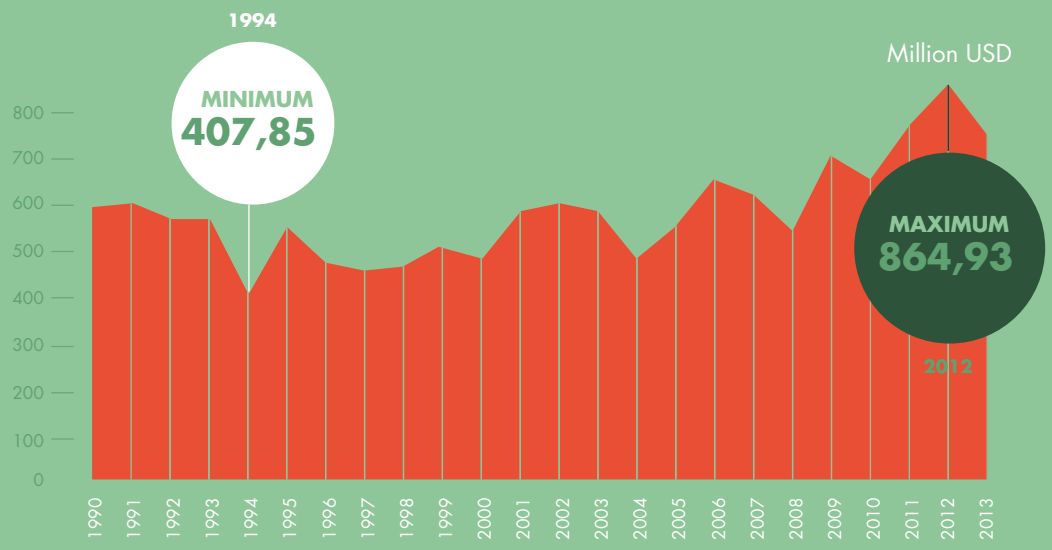
03

## BEANS. VALUE OF PRODUCTION

The value of production has remained steady.

**1990-2013**

**Average value**
**590**
Million USD

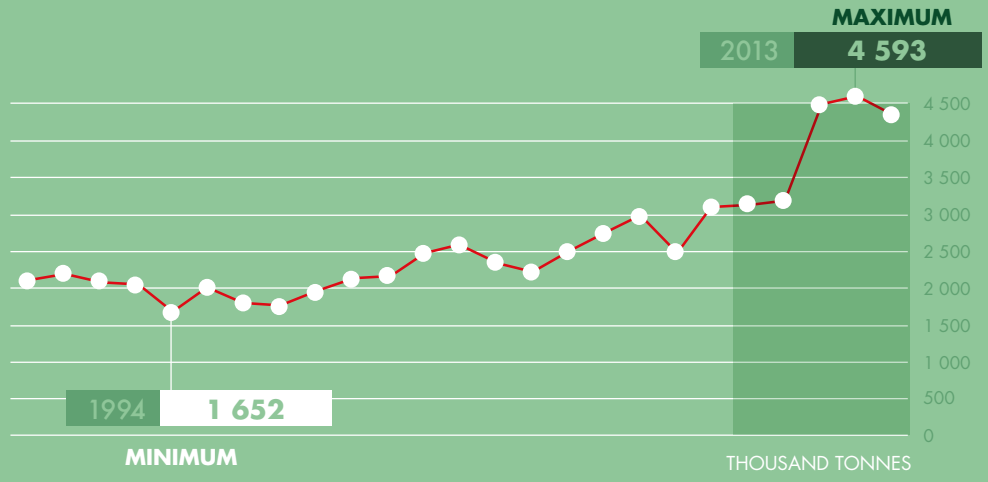



04

## BEAN PRODUCTION

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

**2010-2014**
**3 939**
THOUSAND TONNES




05

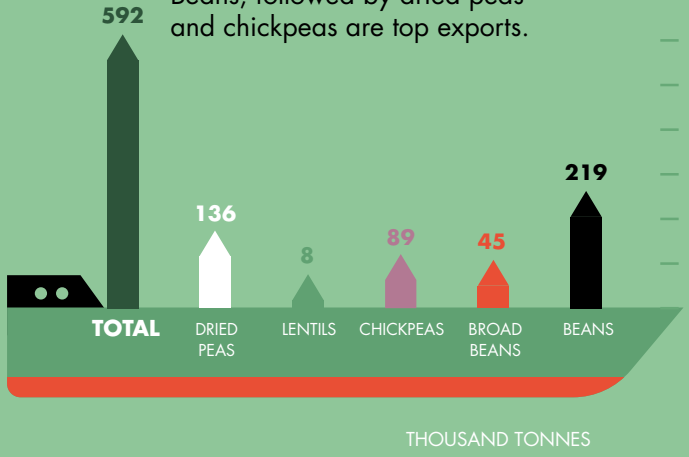
## QUANTITY OF IMPORTS PER TYPE OF PULSE*

The region imports 20% less than its exports.

06

## 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.

**KARATU (TANZANIA)**
Chef Veronica Jackson.

## THE PULSE OF THE SAVANNAH

# VERONICA JACKSON: MASAI SENSITIVITY

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 can enjoy East Africa's rich wildlife and landscape of rare beauty, including areas still inhabited by legendary tribes. Safaris are 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 is African.

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 15 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 the 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 years. 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 in all 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 visitors or incorporate contemporary western and eastern culinary trends.

Chef Veronica Jackson in her garden patch and in the kitchen of the restaurant in Kitela Lodge.

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, and their delicious and exotic names whet the appetite: *kunde kunde, mbaazi, maharagwe soya, maharagwe mabichi, dengu, choroko, nyayo maharagwe, ngwara mea…*

TRADITIONAL PLATE

# Maharagwe

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.

1 CUP OF KIDNEY BEANS

SOAKED APPROX. 10 HOURS

CHOPPED CORIANDER

1/2 KG OF MINCED MEAT

2 TOMATOES CHOPPED

## INGREDIENTS:

2 GARLIC CLOVES CRUSHED

OIL FOR FRYING

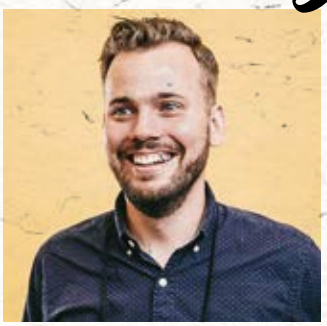
2 CARROTS CHOPPED

1 ONION CHOPPED

# 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 Mamounia and Dorling Kindersley's *Top 10 Guide to Marrakech*.

**alankeohane.com**



**Benjamin Rasmussen** (USA)
has found his work included in the *American Photography* Annuals (nos. 26, 28 30) and was recognised in the 2010 POYi awards. He has been selected as one of Photolucida's 2010 Critical Mass Top 50 and included in the Magenta Foundation's Flash Forward - Emerging Photographers 2011 and 2012 lists.

**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 Endowment of the Arts SNCA/FONCA fellowship (2012-2015). His most recent assignments have been featured in *National Geographic, The Guardian, The Sunday Telegraph, The Wall Street Journal,* and *ESPN, Monocle* and *Wallpaper* magazines.

**adamphotogallery.com**

**Samuel Aranda** (Spain)
was awarded the World Press Photo of the Year for an image from the Yemeni uprising. In 2006, his feature on African emigrants received the Spanish National Award for Photography. In 2015 and 2016 he won the Nikon Photography award for his coverage of the Ebola and refugee crises and the Ortega and Gasset award in 2016.

**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.

**Giuseppe Bizzarri** (Italy)
specializes in photography, videography and writing on social, political and humanitarian issues. In 2000 he won the Zapping prize for journalism by the Italian magazine *Avvenimenti* for his report on Brazilian prisons, and his work is exhibited in Rome, Paris, São Paulo and Rio de Janeiro.

**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.mollysnetwork.org for which he was awarded an MBE.

**pauljhicks.com**

# Writers

**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 Geography 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 Pais*, 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**

# Illustrators

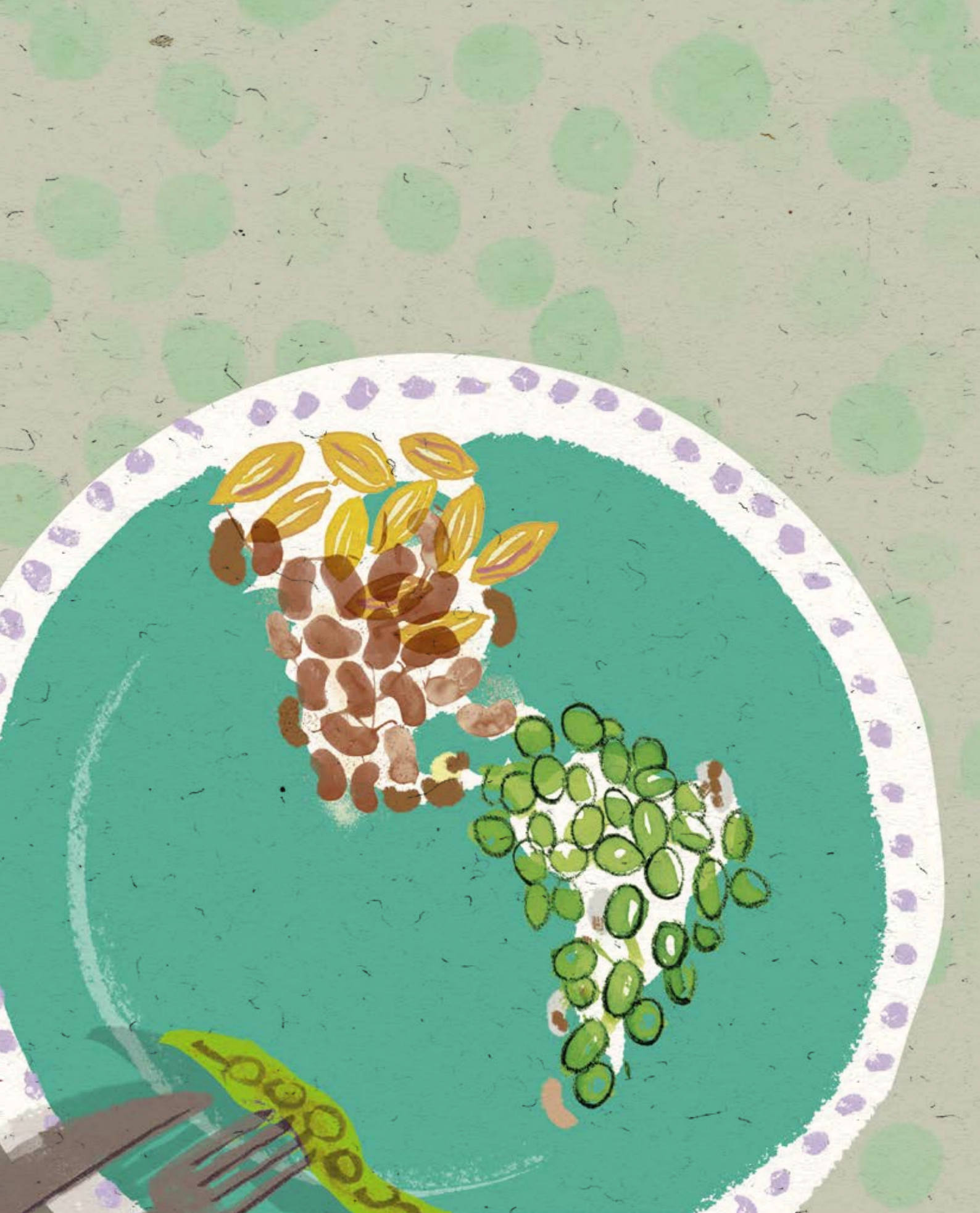
**Justin Jin** (UK-China)
shoots epic projects for *Geo*, captures front-page reporting for the *New York Times*, and has held a major solo exhibition at Amsterdam's Rijksmuseum. International accolades include the Magnum Award, Pictures of the Year International (POYi), and World Press Photo Masterclass.

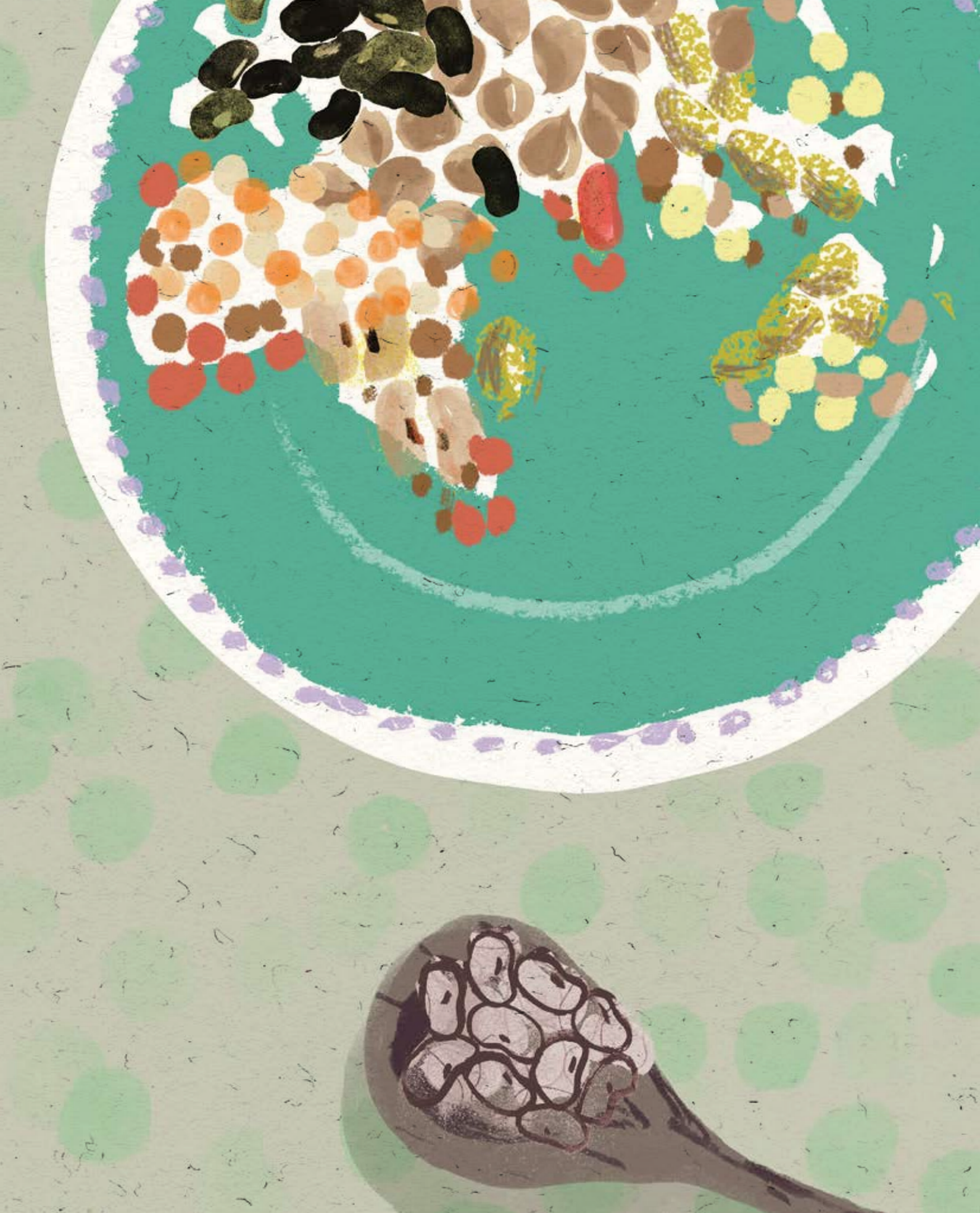
**justinjin.com**

**Nik Neves** (Germany–Brazil)
was selected as one of the 10 best illustrators of Latin America by AI-AP 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.





ISBN 978-92-5-109463-1

9 789251 094631

I6310En/1/10.16