



**USA DRY PEA & LENTIL COUNCIL  
AND  
AMERICAN PULSE ASSOCIATION**

CIA Consulting Department, Hyde Park, New York

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THE WORLD'S PREMIER  
CULINARY COLLEGE

Welcome to the CIA!

Education is a gift. And, those of us in the foodservice industry have a chance to “pay it forward” by sharing our gifts with others. For over 60 years, The Culinary Institute of America has provided students with unparalleled training, setting the gold standard for culinary excellence.

Whether you are here to learn new skills and techniques, develop an appreciation for a global cuisine, or are in pursuit of ProChef Certification, our continuing education courses provide the training you need to achieve your personal and professional development goals.

While on campus, we want you to have the best experience possible. If you have any questions along the way, please ask your chef-instructor or anyone on the Continuing Education staff. Once your training is complete, please feel free to stay in touch - we always enjoy hearing your success stories.

And, because so many of our students ask how they can keep in touch with each other after class is over, we’ve made it easy to do through our Facebook page. Just log in and search for “CIA ProChef.”

Wishing you all the best,

Brad Barnes, CMC  
Senior Director Educational Enterprises  
845-451-1613 | [b\\_barnes@culinary.edu](mailto:b_barnes@culinary.edu)

P.S. Did you know that the CIA is an independent, not-for-profit college? As such, your tuition supports our core mission of providing the world’s best professional culinary education. If you’d like to further support the future of food with the gift of education, please visit [www.ciagiving.org](http://www.ciagiving.org).



MEMO TO: CIA CONTINUING EDUCATION STUDENTS  
FROM: OFFICE OF THE REGISTRAR  
RE: PRIVACY OF STUDENT RECORDS

The *Family Educational Rights and Privacy Act* (FERPA) is the federal law that governs release of and access to student education records. These rights include:

1. The right to inspect and review your education record within a reasonable time after the CIA receives a request for access. If you want to review your record, contact the Registrar's Office to make appropriate arrangements.
2. The right to request an amendment of your education record if you believe it is inaccurate or misleading. If you feel there is an error in your record, you should submit a statement to the Registrar's Office, clearly identifying the part of the record you want changed and why you believe it is inaccurate or misleading. The Registrar will notify you of the decision and advise you regarding appropriate steps if you do not agree with the decision.
3. The right to consent to disclosure of personally identifiable information contained in your education records, except to the extent that FERPA authorizes disclosure without consent. One exception which permits disclosure without consent is disclosure to school officials with "legitimate educational interests." A school official has a legitimate educational interest if the official has a need to know information from your education record in order to fulfill his or her official responsibilities. Examples of people who may have access, depending on their official duties, and only within the context of those duties, include: CIA faculty and staff, agents of the institution, students employed by the institution or who serve on official institutional committees, and representatives of agencies under contract with the CIA.
4. The right to file a complaint with the U.S. Department of Education concerning alleged failures by the CIA to comply with the requirements of FERPA.

Release of student record information is generally not done at the CIA without the expressed, written consent of the student. There are, however, some exceptions. For example, directory information includes the following, and may be released without the student's consent: name, permanent address, campus box number, CIA email address, photographs, program of study, dates of attendance, and degrees or certificates awarded with dates. Please note that you have the right to withhold the release of directory information. To do so, you must complete a "Request for Non-Disclosure of Directory Information" form, which is available from the CIA Consulting Department at 845-905-4417. Please note two important details regarding placing a "No Release" on your record:

1. The CIA receives many inquiries for directory information from a variety of sources outside the institution, including friends, parents, relatives, prospective employers, the news media, and others. Having a "No Release" on your record will preclude release of such information, even to those people.
2. A "No Release" applies to all elements of directory information on your record. The CIA does not apply "No Release" differently to the various directory information data elements.

A copy of the *Act*, more details about your rights, and any CIA policies related to the *Act* are available at <http://www.ciachef.edu/consumer-information/#psr>.

Questions concerning FERPA should be referred to the Office of the Registrar, The Culinary Institute of America, 1946 Campus Drive, Hyde Park, NY, 12538.

## **CIA INSTRUCTOR POLICY ON PROPRIETARY INTERESTS DISCLOSURE AND REPRESENTATION**

The instructor does not have a proprietary interest in any product, instrument, device, service, or material to be discussed during the learning event, nor does the instructor receive third-party compensation related to the presentation.

## EXPECTATIONS FOR PARTICIPANTS

- ☑ Remain in attendance for the class duration
  - Course Satisfactory Completion Requirements  
Students must participate in all exercises and discussions and attend at least 95% of the course to be awarded Continuing Education Units from the IACET.
- ☑ Actively participate
- ☑ Return promptly from breaks
- ☑ No cell phone use or text messaging during class
- ☑ Complete the course evaluation
- ☑ Follow all established health and safety regulations
  - In addition to the precautions necessary to guard against food-borne illness, care must also be taken to avoid accidents. The following safety measures should be practiced.
    - Wash hands before beginning work in the kitchen
    - Keep all perishable items refrigerated until needed
    - NYS law - when handling “ready-to-eat” food items, if you don’t cook it, glove it!
    - Wash hands, cutting boards, knives, etc. when switching between meats and vegetables
- ☑ Adhere to appropriate CIA uniform and attire standards as outlined on the following page.

# CIA UNIFORM POLICY

To foster a professional working environment and to maintain the highest standards of safety and sanitation, the CIA has adopted the following uniform code. Each item has been designed with a practical function in mind. These items must be worn in all production classes unless otherwise stated.

- ☑ Chef's jacket
  - Double-breasted structure creates a two-layer cloth barrier to help prevent steam burns, splashes, and spills
  - Can be re-buttoned on the opposite side to cover spills
  - Sleeves are long to cover as much arm as possible to reduce burns
- ☑ Pants
  - Hounds-tooth helps camouflage stains
  - Best without cuffs, which can trap hot liquids and debris
- ☑ Shoes and Socks
  - Shoes
    - Should be made of hard leather, with low heels, slip-resistant soles, and no open toes
    - Prevent slips and falls in the kitchen
    - Offer support
    - Protect feet from falling pots
  - Socks
    - Must be worn for hygienic purposes and to prevent burns
- ☑ Neckerchief (optional)
  - Helps to absorb sweat
- ☑ Toque (provided in class)
  - Contains hair
  - Absorbs sweat
- ☑ Apron (provided in class)
  - Protects jacket and pants from excessive staining
- ☑ Side towel (provided in class)
  - Protects hands when working with hot pans, dishes, and equipment
- ☑ Jewelry
  - Not permitted except for one plain ring to minimize exposure to potential hazards
- ☑ Hair
  - Should be neatly maintained, clean, and under control at all times  
Long hair should be pinned up and worn under a hair net

## GREYSTONE TEACHING FLOOR AND OPERATIONAL OVERVIEW

In order to maximize efficiency and minimize safety hazards, this document is designed to familiarize everyone with the operation of the dish room. Please take a moment to read through it so the dishwashers can help make your stay a happy and safe one.

1. All pots, pans, utensils and small equipment are to be brought into the dish room and placed neatly on the rack immediately left of the triple sink.
2. The pass through window is only to be used for dishes, glassware and silverware.
3. Any knives, peelers or sharp machine blades are to be washed by the students/chefs at their station. For the sake of safety, please do not bring them into the dish room.
4. All cutting boards should be scrubbed and sanitized by the students in their own work areas.
5. Food processor bowls, blender cups and mixer parts – except for blades – may be brought to the dish room.
6. Cleaning of student work areas, stove tops and large equipment that cannot be brought to the dish room is the responsibility of the students and instructors.
7. Remove excess food and/or trash from all pots and pans before bringing them to the dish room.
8. Alert the dishwasher of all hot pans and utensils when dropping them off.
9. If you need equipment cleaned immediately, the dishwashers will be happy to clean it and return it to you.
10. If you bring any of your own personal equipment to the dish room, let the dishwasher know so it can be returned to you.

# CHEF AND SPEAKER BIOS



## **Lars Kronmark, CWP**

*Professor, Culinary Arts, Culinary Institute of America at Greystone*

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A native of Denmark, Chef Kronmark helped open the CIA Greystone in 1995. Prior to his current role at the CIA Greystone, Chef Kronmark's professional background includes: Coordinator of Culinary Staff, Auction Napa Valley, Napa Valley Vintners, St. Helena, CA; Food and Wine Pairing Judge, North Lake Tahoe Autumn Food and Wine Festival, Lake Tahoe, CA; Chef-Instructor, China Educational Project, Shanghai and Beijing, China; Chef-

Instructor and Department Head for Hot Foods, California Culinary Academy, San Francisco, CA.

Awards include: Antonin Carême Medal, ACF, 2013. Chef of the Year, Cordon d'Or-Gold Ribbon Academy of the Culinary Arts, 2007. Celebrity Guest Chef, Napa Valley Wine Auction, 2010. Winner, Cochon 555 Cooking Competition, 2012.



## **Christine Farkas**

*Owner, IHeartFood Canada*

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Christine Farkas is a chef consultant and owner of IHeartFood Canada, a culinary consulting company based out of Vancouver, British Columbia. With a background in culinary management and food product development; one of Christine's passions is for pulses and exploring ways to inspire through application. Her work also focuses on recipe and product development, hands-on culinary workshops and trendspotting through travel.



## **Maeve Webster**

*President, Menu Matters*

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Maeve Webster, President of Menu Matters, is a leading consultant for foodservice manufacturers and operators. She has spearheaded hundreds of major industry studies during her 17 years as a foodservice specialist, and today runs a private consultancy focused on helping manufacturers and operators analyze, understand, and leverage foodservice trends. Maeve's expertise is in the areas of

trend analysis, market assessment, consumer behavior, product testing, and brand optimization.

During the past decade, Maeve was Senior Director at Datassential. During that time, she helped develop several of Datassential's new products and programs including the company's publications group and TrendSpotting package, headed the company's health & wellness group, and participated in several industry initiatives including the Culinary Institute of America's Healthy Menu R&D Collaborative.

She is a regular speaker at top industry events and has contributed to major media outlets including The Wall Street Journal, NPR, CNBC, MSNBC and CBS. She regularly contributes to several industry publications including Flavor & the Menu. Maeve earned her MBA at the University of Illinois, and holds a culinary degree from Le Cordon Bleu in Chicago.

# COURSE OVERVIEW

## PULSES: BEANS, LENTILS, CHICKPEAS AND DRY PEAS

Due to health concerns and growing awareness of the environmental impact of industrialized food systems, plant-based protein is one of the largest-growing food trends for 2017 and beyond. Plant-based proteins are nutritious, sustainable and affordable alternatives or additions to animal proteins. With increased consumer receptivity to plant-based menus, now is a perfect time for foodservice operators (both commercial and non-commercial) to embrace the trend. As a versatile and non-allergen source of plant-based protein, pulses can help foodservice operators meet consumer demand with delicious, plant-centric menus, while improving profits.

The goal of this program is to showcase the potential of pulses as a hardworking, versatile, nutritious and most importantly delicious part of a healthy diet. We will showcase recipes and techniques that address all day parts and menu parts.

### LEARNING OBJECTIVES

*By the end this course, you will better understand...*

- What pulses are and how to use them
- The nutritional implications of a plant-based diet that includes pulses
- The versatility of pulses as a functional ingredient in the kitchen and bakeshop
- The place of pulses in the global kitchen
- How including pulses in your diet can increase fullness

*\* Not one of top U.S. 8 food allergens*

# DAY ONE

## INTRODUCTION

### WHAT ARE PULSES?

Pulses are the sub-category of legumes that includes dry beans, chickpeas, lentils and dry peas. Whereas legumes are any plant that grows in a pod, pulses are the edible seeds of legumes which are generally harvested dry (unlike green beans, snap peas, etc.) and have a lower oil content than legumes like peanuts and soybeans. All pulses are an excellent source of fiber, a good source of protein, and are rich in other nutrients like potassium, iron, folate and antioxidants. In fact, in the United States, pulses are the only food to fit into two groups on the USDA MyPlate Guidelines, counting as either a vegetable or a protein.

Pulses can be cooked from dry, or are commonly available canned and flash-frozen. They can be used in their whole form in appetizers, soups, salads, entrées and even desserts, and can also be used to increase the nutritional density of a dish when used in their flour or flaked form. The protein of pulses is high in lysine and low in sulfur-containing amino acids. Grains' protein is low in lysine but high in sulfur-containing amino acids. Combining them provides a higher protein quality. This means that the body needs less protein to fulfill its protein needs, which improves nutrition, especially in low-income communities, where the availability of other sources of protein such as animal protein are limited. The combination also contributes to a balanced diet. When mixed with a cooked grain, pulses will make a complete protein, with regard to amino acid content.

# What Are Pulses?

Pulses are one of the most versatile foods on the planet. Composed of dry peas, lentils, chickpeas and beans, these tiny powerhouses pack a hearty fiber- and protein-rich punch – and they're sustainable to boot.

## Chickpeas

(Garbanzo Beans)



KABULI

DESI

PULSES



Explore recipes at:  
[pulsepledge.com](http://pulsepledge.com)

## Lentils



GREEN

RED

SMALL  
BROWN

FRENCH  
GREEN

BLACK

## Dry Peas



SPLIT  
GREEN

SPLIT  
YELLOW

WHOLE  
GREEN

WHOLE  
YELLOW

## Beans



ADZUKI

BLACK

BLACKEYE  
PEAS

KIDNEY  
DARK RED

KIDNEY  
LIGHT RED

GREAT  
NORTHERN

NAVY



PINTO

FAVA

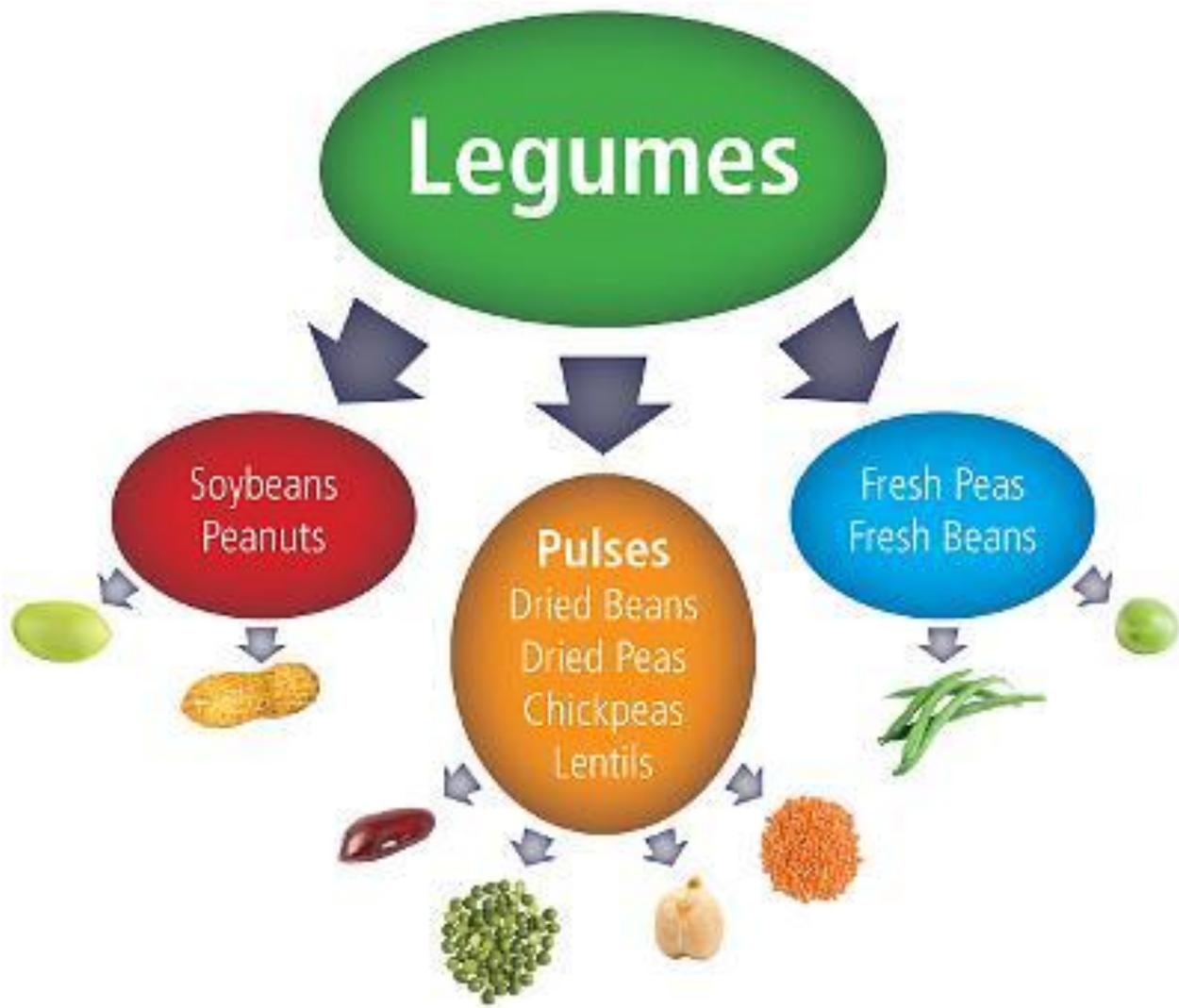
SMALL RED

MUNG

LIMA

CRANBERRY

PINK



First cultivated over 200,000 years ago, pulses are among the world's most ancient crops. Archeologists have discovered peas in caves in Thailand that date back more than 11,000 years. The royal Egyptian tombs contained lentils, meant to sustain the dead on their journey to the afterlife. In the Christian Bible, Esau sold his birthright for a pottage of lentils. And, in Italy, peas (*Pisum* sp.), lentils (*Lens Culinaris*), and chickpeas (*Cicer arietinum*) lent their names to the prominent Roman families of Piso, Lentulus, and Cicero.

Pulse crops may well have even saved Western Civilization during the Dark Ages. It was well documented that the introduction of pulses into crop rotation practices resulted not only in increased farm productivity but also in a more diverse and nutritional diet for the populace. Italian writer and academic Umberto Eco argues that peas, beans, and lentils "saved civilization." Just as they do in many food-insecure countries in the world today, pulses improved the protein content and nutritional quality of the European diet during the Dark Ages, saving people from malnutrition and allowing them to repopulate Europe after the plague.

Perhaps in recognition of their extraordinary qualities, many cultures have developed traditions involving the eating of various pulses. One of the most important celebrations in Iran, for example, is *No Ruz*, the New Year celebration. During this 13-day celebration every house maintains a New Year's table known as the "seven S's," which includes seven symbolic objects beginning with the letter "S." Germinating seeds of lentils, known as *sabzi*, hold the place of honor in the center of the table to symbolize renewal and rebirth—a fresh start for the year. Similarly, in the United States, eating black-eyed peas on New Year's is commonly thought to bring prosperity.

For hundreds of years, the people of northern Italy have enjoyed their own New Year's tradition. In celebration of *Capo d'Anno* (literally "head of the year"), lentils, symbolizing coins, are eaten to ensure good fortune for the year ahead. Consuming these "coins" is thought to make wealth and prosperity part of one's blood and being. In addition, the consumption of lentils, rather than more exotic or expensive foods, demonstrates humility

to both heaven and society and averts the wrath of heaven that falls on those who are too proud.

As awareness of the health benefits, earth-friendliness and affordability of plant-based proteins like pulses grows, the American consumer is starting to rediscover some of the food traditions tied to pulses. Recently there has been a great deal of interest and focus on the many benefits of the Mediterranean diet, of which pulses are a central component. It seems impossible to read a newspaper without seeing an article about eating our way to better health through nutraceuticals or phytochemicals.

Pulses are recognized as such a valuable food source that the Food and Agriculture Organization (FAO) of the United Nations named 2016 International Year of Pulses, aiming to highlight the "nutritional benefits of pulses and encourage a paradigm shift toward including more of this nutritional powerhouse in diets all over the world. (Reference: Food and Agriculture Organization of the United Nations, 2016, I5384E/1/02.16)

Edited Source: *The Pea & Lentil Cookbook: From Everyday to Gourmet* by USA Dry Pea & Lentil Council with Randall Duckworth (C&C Offset Printing, 2000)

## **DRY BEANS**

Beans have been used throughout the world for thousands of years, and come in hundreds of shapes, sizes and colors. Common varieties of dry beans include adzuki, black, black-eyed peas, dark or light red kidney, great northern, navy, pinto, small red, Lima, cranberry, fava and pink beans. Most beans can be soaked before cooking from dry, to reduce cooking time and activate enzymes, proteins, minerals and vitamins.

## ==THE ORIGINS OF WILD AND DOMESTIC BEANS==



### CHICKPEAS

The ancient Romans thought chickpeas looked like rams' heads with curling horns, but in modern times they are often likened to small hazelnuts. They have a nutty, faintly chestnut-like flavor and a texture so firm that they are nearly impossible to overcook. In the United States, buff-colored chickpeas are the norm, but in India there are red, black, and brown varieties.

Chickpeas have been around since about 5,000 B.C. and are used today in many countries — from Spain through Turkey and the Middle East into India. They are the key ingredient in

Middle Eastern hummus (the dip made with chickpeas and sesame paste) and falafel (fried chickpea patties), and in India are eaten fresh in salads, stir-fries, and as a snack. In addition to being a perfect base for many dishes, chickpeas can be roasted and ground into a flour that is employed in batters for vegetable fritters and other savory foods.

In addition, chickpeas can be used in snacks and desserts, like energy bites or baked goods. Even the leftover cooking liquid (or liquid from canned chickpeas), also known as *aquafaba*, can be whipped to form a meringue-like consistency, which can be used as an egg replacer or in applications like vegan chocolate mousse.

Some recipes call for removing the skin of the chickpeas after they are cooked, but this is not really crucial. Chickpeas are also referred to as garbanzos (their Spanish name) and ceci (their Italian name).

Source: *Grains, Rice, and Beans* by Kevin Graham, (Artisan Books, 1995)

## **LENTILS**

Lentils, tiny disk-shaped pulses, grow in pods on a climbing vine similar to the pea. Though their origin is unknown, it is hypothesized that they date back about 8,000 years and originated somewhere around present-day Iraq or Turkey. They are known to have played an important role in the diets of the ancient Greeks, Romans, Egyptians, and Hebrews, and today are most widely consumed in India, the Middle East, and Africa; lentils are also a frequent ingredient in soups in many parts of Europe. In India, lentils (often skinned and split in half) are served with nearly every meal and are also ground into flour.

These wonderful little “lenses,” which is what the word lentil means in Latin, comes in numerous colors, ranging from russet brown to olive green to orangey-red to yellow to black. The most expensive of all lentils are French green lentils or lentilles du Puy, which are a dark brownish green on the outside and yellow on the inside; they are firmer than most other lentils and boast a slightly peppery flavor. Packaged French green lentils also tend to be very consistent in size and quantity.

Lentils do not need to be presoaked and they cook quickly. Lentils that hold their shape after cooking, such as brown or green lentils, are best in salads. Lentils that soften quickly (e.g., red lentils) work well in purées and as a thickening agent for soups and salad dressings (for best results, purée the lentils before adding them to the liquid to be thickened). Lentils sold in the United States as dhal (the word used for lentils in India) have been skinned (i.e. decorticated) and are lower in dietary fiber than non-decorticated lentils.

Source: *Grains, Rice, and Beans* by Kevin Graham (Artisan Books, 1995)

## **DRY PEAS**

Whereas fresh peas boast a delicate, sweet flavor, dry peas (which are commonly available in green or yellow varieties) are nutty and robust. Most dry peas in the United States are sold skinned and split, an unfortunate reality since whole dry peas – the main ingredient in the “peas porridge” of nursery rhyme fame – are higher in fiber and more flavorful. Split peas do not need to be soaked, but whole peas should be soaked overnight before cooking.

In addition, dry pea fractions (flours, starches and protein isolates) are commonly used in foodservice applications and development of products for retail. Pea protein powder is a great plant-based alternative to whey protein, and pea flour and pea starches can be used to make nutrient-fortified baked goods and extruded snacks.

Source: *Grains, Rice, and Beans* by Kevin Graham, (Artisan Books, 1995)

## A FEW BASICS ABOUT COOKING DRY PEAS, LENTILS, AND CHICKPEAS

The first step in your preparation process is ensuring that the peas, lentils and chickpeas you are using are of United States origin. Peas, lentils, and chickpeas from other origins such as Canada, Turkey or India, are known to have higher levels of foreign matter and make take much longer to cook because of hard seed problems (a result of harvesting at higher moisture rates before the product is fully matured). Peas and lentils from the United States are dried naturally in the sun and harvested at low moisture rates resulting in a product that does not require soaking. In fact, soaking peas and lentils from the United States will likely result in overcooking the product (Note: chickpeas, regardless of origin, still need to be soaked prior to cooking). Cooking times may vary slightly depending upon the variety. Times given are approximations, and you should adjust them to meet your needs. High altitude, hard water, and salt added to the cooking water will increase the cooking time.

### Dry Split Peas or Whole Peas

As with lentils, there is no need to soak split peas from the United States. For every cup of split peas or lentils, use at least 2 ½ cups of water. Add more water if cooking time is extended due to high altitude, hard water, etc. Bring water to a slow boil and cook the split peas for about 30 to 40 minutes, or until the peas reach the desired tenderness. One cup of dry peas will yield just under 2 ½ cups of cooked peas. For whole peas, soak overnight and then cook for 35 to 40 minutes. As with lentils, do not add acidic ingredients such as tomatoes or lemon juice to the peas while cooking. Add these ingredients only after lentils have achieved desired tenderness. Small amounts of acidic ingredients, however, may not lengthen cooking time.

#### **Split pea cooking times:**

Salads: 25 to 30 minutes  
Main dishes: 30 to 40 minutes  
Soups: 45+ minutes  
Purées: 45+ minutes

#### **Split pea yield:**

1 cup raw: 2½ cups cooked

*The Busy Cook Almost-Perfect Method*—In a medium size pan, combine at least 2 ½ cups of water with each cup of lentils or split peas. Add more water if you are cooking at high

altitude or with hard water. Bring to a boil, cover, and simmer **slowly**, until the lentils or split peas are tender. Drain off any excess water. Split peas tend to froth and boil over. Keep the pan only partially covered, with the lid one-half inch away from the edge of the pan, to avoid build up of froth and subsequent boiling over.

**Split pea cooking times:**

Salads: 25 to 30 minutes  
Main dishes: 35 to 40 minutes  
Soups: 40+ minutes  
Purées: 45+ minutes

**Split pea yield:**

1 cup dry: 2½ cups cooked

**Lentil cooking times:**

Salads: 25 to 30 minutes  
Main dishes: 30 to 40 minutes  
Soups: 45+ minutes  
Purées: 45+ minutes

**Lentil yield:**

1 cup dry: 2½ cups cooked

Decorticated lentils (lentils without their outer skins, such as Red Chief) cook in 6 to 12 minutes, depending upon the variety. Pay close attention when cooking decorticated varieties; they cook quickly and will turn to mush if overcooked or cooked at a rapid boil. One cup of dry whole lentils yields a generous 2 ½ cups; split peas yield just under 2 ½ cups; decorticated lentils yield about 2 cups.

**Preparation of Chickpeas**

In a medium size pan, combine 1 cup of soaked chickpeas and 2 ½ cups of water. Add more water if you are cooking at high altitude or with hard water. Bring to a boil, cover and simmer until the chickpeas are tender.

Many people prefer to use canned chickpeas because of the convenience. However, some find a noticeable difference between canned chickpeas and those they prepare. The difference is typically noticeable in dishes that most bring out the taste of the chickpeas, such as hummus. Try both forms to find which you prefer. One 15-ounce can contains a scant 2 cups.

**Chickpea cooking times:**

All uses, from dry: 1½ to 2 hours  
Canned: ready to use

**Chickpea yield:**

1 cup raw: 2½ cups cooked

### **Adding acidic ingredients**

Adding tomatoes, lemon juice or other acidic foods at the beginning of cooking may dramatically increase cooking times. Add these ingredients only after lentils, split peas and chickpeas have achieved their desired tenderness. Salt may increase cooking times as well. However, some cooks feel that adding salt initially, or using broth instead of water, results in better flavor because the salt spreads more uniformly through the legume. Feel free to experiment.

A squeeze of fresh lemon added near the end of cooking cuts down on the earthy flavor associated with some lentil varieties.

### **Purchasing**

Dry peas, lentils and chickpeas are most commonly sold in 1-pound bags in the beans and rice section of the supermarket. If you cannot find them at your local supermarket or natural food store, you may order them through a mail order service. Precooked lentils in jars or cans, though common in other parts of the world, are hard to find in the United States. Look for them first at your local health food or ethnic food store. GOYA Foods (Seacaucus, New Jersey) offers canned peas and lentils. Ask your grocer to carry them if they do not already.

### **Precooking and storage**

Precooked lentils or split peas can be refrigerated in a tightly covered container for 3 to 4 days or can be frozen. Use precooked lentils or split peas in salads, soups, main dishes, purées, or in baking. If you plan to use precooked lentils or split peas in dishes that will require further cooking—soups or main dishes, for instance cook lentils and split peas until barely tender or about 15 to 20 minutes, respectively, when you prepare a recipe using precooked lentils or split peas, you may need to reduce the liquid in the recipe by 1/3 to 1/2.

### **How to Purée Peas and Lentils**

Adding lentil or split pea purée to your baked goods batter increases protein, fiber and moistness. The basic lentil or split pea purée is made as follows:

Add 2 ½ cups of water per cup of split peas or 2 cups of water per cup of lentils. Bring to a boil, reduce heat, cover, and simmer. Simmer 10 to 20 minutes for decorticated (skinned) lentils, 35 to 40 minutes for whole lentils, and 45 to 55 minutes for split peas. Add more water if cooking time is extended due to high altitude, hard water, or prolonged storage prior to cooking. Stir a few times. Cook lentils or split peas until they are very soft but just short of falling apart. When cooking is complete remove from heat and let cool slightly but do not drain. In small batches, purée the lentils or split peas with a sieve, food mill, blender, food processor, or potato masher.

Purée should be the consistency of canned pumpkin. Add water to thin if necessary.

### SUGGESTED SOAKING AND COOKING TIMES FOR LEGUMES

Legume	Long Method	Short Method	Cooking Time
	Hours	Hours	Hours
Chick peas	12	3	1-½ to 2
Lentils	No soaking needed		20 to 30 minutes
Split peas	No soaking needed		20 to 30 minutes

### STORAGE OF DRY PEAS, LENTILS, AND CHICKPEAS

Storing dry peas, lentils, and Chickpeas is simple. Dry peas, lentils and chickpeas will keep indefinitely when stored in sealed containers in a cool, dry place. After long storage their color may fade slightly, but their taste will not be noticeably altered. Long storage may increase cooking time.

### A Few Words about Spices and Herbs

Herbs and spices are essential to the success of a prepared dish. Even under ideal conditions, herbs and ground spices will begin to deteriorate after about one year and whole spices after three years. Shelf life guidelines are one to three years for herbs and ground spices, and three to four years for whole spices and seeds.

Essential oils, known as terpenes, provide the characteristic smell and taste of herbs and spices. The shelf life of herbs and spices depends on how well these oils are preserved. Without them, herbs and spices taste no better than grass clippings. To preserve them, always use glass, airtight containers. Do not use cork as a stopper because it is not airtight. Store in a dark, dry place— not in a spice rack near the stove or a window. If fresh herbs are available, use them. They are less concentrated than dry herbs, so use three to four times more.

Discard herbs and spices if the contents cake together, you find signs of insects, or if the herb or spice is devoid of smell and taste.

## **COOKING PULSES**

Soaking dry pulses before cooking can improve digestibility. Generally, 12 to 24 hours is a good guideline for soaking time. If time constraints preclude soaking, place dry pulses in water and bring quickly to a boil; then remove the pot from the heat and allow it to rest for about one hour. Then, simmering the pulses until they are tender will result in a quality product with little damage to them.

In cooking pulses from their dry form, pay constant attention to the liquid level; over a prolonged period of cooking time the liquid will evaporate. Therefore, a supply of boiling water or stock to one side will keep the cooking action constant and the temperature at a proper level.

Avoid adding salt to pulses until toward the end of the cooking time, as it causes them to harden and therefore they will take longer to cook. Other seasonings should also be added toward the end of the cooking time; otherwise, they tend to neutralize and the flavors become lost. Lentils and split peas are the exception to the rule; for these two items, soaking is not required and seasonings can be added at the start of the cooking action.

When reheating a dish that is comprised of beans, adjustment of the seasoning is very important as flavors are lost through the cooling action.

Many pulses are soaked in water from 4 to 8 hours – a practice that will dramatically reduce their phytate content and cooking time and their propensity to cause flatulence. Soaking ensures that pulses can be more easily digested and their nutrients better absorbed by the body. In fact, soaking dried pulses for several hours brings them back to life, activating their enzymes. Soaking in sodium bicarbonate solutions is more effective to reduce anti-nutrients than soaking in water alone.

Never throw out the water that pulses have been cooked in! The cooking water can be used as a flavorful stock to enhance the overall taste of the dish, or to create additional dishes (see: aquafaba).

Pulses cooked from dry form will yield between 2 to 2½ times their original dry yield. Lentils and split peas yield 2 to 2 ½ times their original dry yield, while beans and chickpeas expand to 3 times their original dry yield.

# **PULSES 101:**

## **DEMONSTRATION AND TASTING RECIPES**

# DAY TWO

## CHEF'S FAVORITE SHOWCASE: COOKING TIPS, TECHNIQUES AND TASTING

### CHEF LARS

- The Ultimate Vegetarian Dish: Potatoes, Beans, Lentils, and Peas
  - Potato Purée with Lentils, Peas, Chickpeas, Mushroom, and Chile
- Lentils in Coconut and Tomato Sauce
- Pressure Cooking Pointers for Pulses

### CHEF CHRISTINE

- Creating a satisfying meal with complementary proteins: pulses, grains and seeds
  - Chickpea, Split Pea and Millet Salad with Cider Vinaigrette
- Using Aquafaba to create “zero-waste” dishes
  - Pineapple Lime Wine Spritzer with Aquafaba
  - Dark Chocolate Mousse with Aquafaba

## TASTING OF COOKED WHOLE PULSES AND PULSE FRACTIONS

# POTATO PURÉE WITH LENTILS, PEAS, CHICKPEAS, MUSHROOMS, AND CHILE

*Yield: 4 - 6 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Potatoes, Yukon Gold, peeled	2 lb.
Water, to cover	1 qt.
Milk	1 pt.
Salt	to taste
Ground black pepper	to taste
Butter	1 - 2 wt. oz.
Red lentils, cooked until tender in vegetable stock, liquid reserved	4 wt. oz.
Green split peas, cooked until tender in vegetable stock, liquid reserved	4 wt. oz.
Chickpeas, cooked until tender in vegetable stock, liquid reserved	4 wt. oz.
<i>Topping</i>	
Butter	2 wt. oz.
Cremini mushrooms	6 wt. oz.
Shiitake mushrooms	6 wt. oz.
Red chile flakes	¼ tsp.
Hazelnuts, sliced (optional)	1 wt. oz.
Green onions	4 ea.

## **Method**

1. Boil potatoes in 1 quart of water, or just enough to cover.
2. When fully cooked, drain the potatoes and dry in same pot. Purée with a masher, ricer, or food mill and add milk, salt, pepper, and butter.
3. Fold in all pulses and keep warm. If needed, use some of the reserved hot vegetable stock adjust for texture.
4. Heat butter and add your sliced mushrooms, chile flakes, and hazelnuts if using. Sauté under high heat for 2 - 3 minutes. Finish off with green onions and season to taste.
5. Top the potato and pulse mixture with the hot mushroom topping. Serve immediately.

# LENTILS IN COCONUT AND TOMATO SAUCE

*Yield: 4 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Lentils, any desired variety	7 wt. oz.
Canned tomatoes, diced	2 cups
Coconut milk, canned, unsweetened	2 ea.
Red onion, diced	1 ea.
Red bell pepper, diced	1 ea.
Carrots, peeled and diced fine	4 ea.
Garlic cloves, peeled and finely minced	4 ea.
Parsley, picked and chopped	1 bu.
Garam masala	1 Tbsp.
Salt	to taste

## **Method**

1. Rinse the lentils well. Drain.
2. Bring coconut milk and tomatoes to a boil. Add the lentils.
3. Simmer for 10 min. Add diced onion, bell pepper, and carrots.
4. Bring to a simmer and add garlic, garam masala, and a pinch of salt.
5. Simmer 10-15 min more. Add parsley and taste for salt.
6. When fully cooked, serve with toasted multigrain bread rolls.

**Note:** If using black or French-style green lentils, it is advisable to add one extra cup of tomatoes to the coconut milk.

# PRESSURE COOKING POINTERS FOR PULSES

## Ingredients and Equipment

Chickpeas  
Lentils  
Dry peas  
Beans  
Water

Pressure cooker

## Method: Getting Started

1. It is possible to pressure cook dry or presoaked pulses.
2. It is best to pre-soak pulses for 8 - 12 hours. Cooking times vary from 4 - 14 minutes, depending on size and style of the pulse.
3. Un-soaked pulses will take 3 - 4 times longer, depending on their size.
4. Use a quick soak method in case you need pulses fast: Cover pulses with boiling water and let them sit for about 60 minutes. Drain and then cook as desired.

## Method: Pressure Cooking

1. To cook pre-soaked beans, chickpeas and whole dry peas, use  $\frac{3}{4}$  cup of water per cup of pre-soaked pulses.
2. Soaking lentils and split peas is not required, but can reduce cooking times. To cook pre-soaked lentils and split peas, use  $\frac{3}{4}$  cup of water per cup of dry ingredients.
3. To cook un-soaked beans, chickpeas and whole dry peas use  $1\frac{1}{2}$  cup of water per cup of dry pulses.
4. Plan to always chill your pulses on sheet pans for natural cooling, rather than rinsing cooked pulses in water.

# CHICKPEA, SPLIT PEA AND MILLET SALAD WITH CIDER VINAIGRETTE

*Yield: 6 Servings*

*Prep time: 15 minutes*

*Total time: 25 minutes*

<b>Ingredients</b>	<b>Amounts</b>	
Chickpeas, cooked	1 cup	250 mL
Split green peas, cooked	1 cup	250 mL
Millet, cooked	1 cup	250 mL
Red bell pepper, chopped	1 cup	250 mL
Cranberries, dried	1/3 cup	80 mL
Hemp hearts, toasted	1/4 cup	60 mL
Chives, thinly sliced	3 Tbsp.	45 mL
Baby arugula	3 cups	750 mL
<i>Dressing</i>		
Cider vinegar	1/3 cup	80 mL
Whole grain mustard	2 tsp.	10 mL
Thyme	2 tsp.	10 mL
Ground turmeric	1/2 tsp.	2 mL
Maple syrup	1 Tbsp.	15 mL
Olive oil	4 Tbsp.	60 mL

## **Method**

1. In a large bowl toss the first set of ingredients together.
2. For the vinaigrette, combine all of the ingredients in a blender and process until smooth. Season with salt and pepper.
3. Toss the dressing with the salad, adjust season as desired and plate. Enjoy!

## **Notes:**

- Canned chickpeas can be used in this recipe or they can be soaked and cooked from dry.
- Split peas take approximately 25 minutes to cook in simmering water. To retain the texture of the peas cook until tender, drain and rinse under cold water (blanch). This will stop the cooking process of the peas, producing a tender pea that will hold up in salads and other dishes. Overcooking the peas will give a pureed texture.
- Chickpeas and split peas can be substituted for other cooked pulses in this recipe.

## PINEAPPLE LIME WINE SPRITZER WITH AQUAFABA

*Yield: 2 Portions*

*Prep time: 2 minutes*

*Total time: 5 minutes*

<b>Ingredients</b>	<b>Amounts</b>	
Pineapple juice, fresh	½ cup	125 mL
Sauvignon blanc or white wine	½ cup	125 mL
Lime juice	2 Tbsp.	30 mL
Mint simple syrup	1 Tbsp.	15 mL
Lime Aquafaba Foam (recipe follows)	1 Tbsp.	15 mL
Bitters	as needed	as needed

### **Method**

1. Combine all the ingredients in a blender and process on high for a few seconds. A cocktail shaker will work well too.
2. Pour in 2 glasses over ice with a few drops of bitters in each. Serve immediately.

**Note:** Prefer a virgin cocktail? No problem! Simply omit the alcohol. The lime in this recipe still gives the cocktail a lovely bite!

# LIME AQUAFABA FOAM

*Yield: 50 to 75 Dollops*

*Prep time: 2 minutes*

*Total time: 10 minutes*

<b>Ingredients</b>	<b>Amounts</b>
Chickpea aquafaba (liquid from 560 mL can)	1 can
Sugar	2 Tbsp. (or 30 mL)
Lime, zest and juice	1 ea.

## **Method**

1. Open a can of chickpeas and drain the water into a large cylindrical container and add the sugar.
2. Using a whisk attachment on a hand or immersion blender, blend on the highest setting for 5 to 8 minutes, or until medium stiff peaks form.
3. Add the lime zest and use in cocktails to replace egg white, as garnish for mains and desserts, etc.

# DARK CHOCOLATE MOUSSE WITH AQUAFABA

*Yield: 4 Portions*

*Prep time: 5 minutes*

*Total time: 15 minutes + chill time*

<b>Ingredients</b>	<b>Amounts</b>	
Dark chocolate, dairy-free, chopped	7 oz.	200 g
Plant-based milk (almond, rice, hemp, etc.)	2 Tbsp.	25 g
Chickpea liquid (aquafaba), avoid no salt-added	7 oz.	200 g
Sugar	1.7 wt. oz.	50 g

## **Method**

1. Combine the chocolate and milk in a large bowl over a double boiler. Melt until the chocolate is completely smooth, mixing often.
2. Pour the chickpea water and sugar into a large cylindrical container. Using a hand immersion blender with a whisk attachment, whip the chickpea water until medium peaks form.
3. Remove the bowl with chocolate from the double boiler. Take  $\frac{1}{3}$  of the beaten chickpea and stir into the chocolate until fully combined. Take another  $\frac{1}{3}$  of the chickpea mixture and fold in gently. Fold in the remaining  $\frac{1}{3}$  of the chickpea mixture very gently to ensure volume.
4. Portion the mousse into 4 cups and chill for at least 6 hours.
5. Garnish with fresh raspberries or alternative garnishes and enjoy.

## HANDS-ON CREATIVE WORKSHOPS: PULSES IN A PLANT-FORWARD KITCHEN

The purpose of this exercise is to allow you to experiment replacing animal protein with pulses in various applications.

Your assignment is to develop dishes that reflect the trend toward plant-centric menus.

You will have ingredients available to you as listed on the following page.

You can create as many dishes/courses as you like within your groups.

When ready, place your plate and sign indicating the name of your dish in the center of the kitchen to be enjoyed by the group.

### MARKET BASKET EXERCISE

Each team will be able to use a wide range of items like vegetables, stocks, spices, dairy, etc. from the community storeroom (see the Community Storeroom sheet for examples of items available).

You have also been given selected fresh seafood, poultry and meats listed on the next page.

### KEEP IN MIND

- Each team will present one large portion of their dish for a group tasting, and present a second small (tapas-size) plate to refer during class recap.
- Develop the recipes and prepare one portion of each menu item.
- Place your plate in the dining room with proper sign, and verbally explain your thinking behind the dish to the larger group.
- The plate will be shared with the group when ready.
- We will serve a light buffet created by the CIA support team for lunch at 12:30.

## SCENARIO ASSIGNMENTS FOR EACH TEAM

- Your animal protein should comprise no more than 30% of your dish.
- You should also feel free to create entirely vegetarian dishes/presentations.

### TEAM ONE

Upscale Grocery Store / Home Meal Replacement

### TEAM TWO

Fast-Casual Bakery Café / Breakfast or Lunch

### TEAM THREE

Food Truck / Grab & Go Lunch or Dinner from the Global Truck

### TEAM FOUR

University Dining / Students from East to West

### TEAM FIVE

Retail food in Healthcare/Hospital / Lunch Entrée of the Day

### TEAM SIX

Casual Dining / Entrees or Sides

## COMMUNITY STOREROOM

### SUPPORT TO PULSES WORKSHOP

The community storeroom, from which all participants may draw, should include, but not be limited to, most of the following items. Additional aromatics will be available in order to achieve various flavor profiles. The Chef-Instructor will assist you.

<p><b><u>Pulses, Rice and Grains</u></b>  <i>Grains:</i> kamut, quinoa, spelt, &amp; barley</p> <p>Assorted pulses (dry beans, chickpeas, lentils and dry peas raw and in various soaked and/or cooked stages)</p> <p><i>Rice:</i> basmati, jasmine, basmati, &amp; arborio</p>	<p><b><u>Dried Fruits and Nuts</u></b>            Almonds            Pine nuts            Pepitas            Peanuts            Sesame seeds            Tamarind paste</p>	<p><b><u>Dairy</u></b>            Butter            Sour cream            Cream            Eggs            Yogurt            Parmesan cheese            Melting cheese            Cheddar            Milk            Feta            Cottage cheese</p>
<p><b><u>Wine/Vinegar/Sauce/Oil</u></b>            Rice wine vinegar            Red wine vinegar            Balsamic vinegar            Sherry vinegar            Champagne vinegar            Red wine            White wine            Mirin            Extra-virgin olive oil</p>	<p>Tamari/Soy sauce            Madeira            Brandy            Fish sauce            Harissa            Pomegranate molasses            Sambal            Sesame oil            Capers/olives</p>	<p><b><u>Stocks</u></b>            Chicken            Veal            Fish</p>
<p><b><u>Specialty</u></b>            Arbol chilies            Ancho chilies            Chipotle</p>	<p><b><u>Flour</u></b>            Corn meal            Corn starch            Polenta            Brown sugar            Flour            Panko            Chickpea flour</p>	<p><b><u>Miscellaneous</u></b>            Dijon mustard            Tabasco            Steak sauce            All spices on spice rack            Flour tortilla            Corn tortilla            Rice paper</p>

<u>Fruits/Veg</u>	<u>Herbs</u>	<u>Protein</u>
Lemons	Various, from CIA gardens	Chicken breast
Limes		Smoked turkey
Oranges		Ground beef and pork
Onions		Smoked ham
Garlic		Bacon
Carrots		Flank steak
Celery		Sausage selection
Potatoes		Salmon
Squash (hard and soft)		Shrimp
Peppers (fresh green, red and yellow)		Mahi Mahi
Hot peppers (serrano, jalapeño and Thai)		
Basil		
Cilantro		
Parsley		
Tomato (small and large)		
Kale (regular and black)		
Spinach		
Scallions		
Broccoli		
Cauliflower		
Mushrooms (white and brown)		
Avocado		
Mixed lettuce		
Cucumbers		
Radish		
Grapes		

## RECIPE DEVELOPMENT CRITERIA



# RECIPE TEMPLATE

RECIPE NAME:

Ingredients (List in order used)	Preparation (Cut, size, cooked, drained, etc.)	Weight	Volume

## Method

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

# **PULSES 201: PULSES IN THE GLOBAL KITCHEN**

## **CHEF LARS**

- Bean Chips with Thai Curry Bean and Mushroom Dip
- Lentil Meatballs with Fresh Pasta and Carrot Glaze
- Pickled Lentils

*\*Presentation in Viking room, prepped day before or morning of the event.*

## **CHEF CHRISTINE**

- Pulse Flour Snapshot – Global Uses
- Socca Blinis with Split Pea Romesco
- Sustainable/Minimal Waste Kitchen: Chilled soup using whole pulses and scrap vegetables
  - Zesty Garden Gazpacho with Split Red Lentils

# BEAN CHIPS

*Yield: 6 to 8 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Bean or lentil flour	8 wt. oz.
Rice flour	1 wt. oz.
Fine salt	to taste
Spices*	as desired
Olive oil	½ Tbsp.
Water	as needed

## **Method**

1. Mix all dry ingredients in a bowl.
2. Add oil and room temperature water to create a workable dough. Only add 1 to 2 tablespoons of water at the time so that it doesn't become too wet. If you have time, chill the dough before working it.
3. Roll out the dough as thin as you can. Cut out desired shaped or leave as large sheets.
4. Bake at 300°F on silicone mats or deep fry at 360°F until crisp.
5. If necessary, drain oil and keep dry.

**Note:** The spices used here are largely based on preference. I find that ground coriander works very well.

# THAI CURRY BEAN AND MUSHROOM DIP

*Yield: 4 to 6 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Canola oil	2 Tbsp.
Red curry paste	3 - 5 Tbsp. or to taste
Coconut milk, unsweetened (divided use)	1 ½ cups
Fish sauce	2 Tbsp.
Coconut sugar or brown sugar	1 tsp.
Shiitake mushrooms, sliced thin	1 cup
Chicken stock	1 cup
Bean or lentil flour	as needed
Kaffir lime leaves, center stem removed, cut in strips (optional)	6 ea.
Thai basil leaves (optional)	as needed

## **Method**

1. Heat the oil in a small nonstick pan over moderate heat. Add the curry paste and ½ cup of the coconut milk; reduce heat to low and stir until fragrant, about 2 to 3 minutes.
2. Add the fish sauce, coconut sugar, mushrooms, and cook for another 1 to 2 minutes, stirring to coat the vegetables in the curry paste. Add the chicken stock and simmer until flavors are dissolved, 2 to 3 minutes. Sprinkle in bean or lentil flour until texture is thick as sour cream or as firm as desired.
3. Add the kaffir lime leaves and Thai basil leaves if desired and adjust the seasoning.
4. Transfer to a serving bowl.
5. Serve lukewarm with bean chips at the side.

**Note:** You may substitute the chicken broth with vegetable, and omit the fish sauce if desired.

# LENTIL MEATBALLS, FRESH PASTA, AND CARROT GLAZE

*Yield: 4 Portions*

Ingredients	Amounts
Oatmeal	2 cups
Lentils, red or small brown	1 lb.
Water	as needed
Onions, finely diced	3 ea.
Salt	to taste
<i>Spice for flavor profile</i>	1 Tbsp. plus more to taste
Oregano, fresh	
Ground cumin, freshly ground	
Chile powder	
Paprika	
Ground turmeric	
Curry powder	
Soy milk	1 ½ cups
All-purpose flour	1 cup
Soy sauce or tamari	2 Tbsp.
Olive oil, for frying	as needed
Fresh Egg Pasta, fettuccine cut (recipe follows)	as needed
Organic Carrot Glaze (recipe follows)	1x recipe

## Method

1. Grind the oatmeal in food processor to a fine consistency.
2. Boil the lentils with just enough water to cover, with a lid on, for 30 to 35 minutes or until completely cooked. If necessary, carefully drain the lentils of any remaining water.
3. Add the finely diced raw onions and the fresh herbs and spices to the lentils. Mix well.
4. Add the soy milk, oatmeal, flour, and soy sauce or tamari in stages, continuously stirring to create a meat loaf texture.
5. Heat olive oil in a Teflon pan and with a spoon, add an egg size ball of the mixture to the pan. Cook until golden brown on each side. It is alright if they become flat and not round.
6. Keep warm and serve on top of fresh fettuccine pasta with carrot glaze.

# FRESH EGG PASTA

*Yield: 6 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Durum flour	1 lb. (3 ⅓ cups)
Salt	1 pinch
Eggs	4 ea.
Olive oil (optional)	2 Tbsp.

## **Method**

1. Combine the flour and salt in a food processor. Add the eggs and oil, if using. Process the mixture until it resembles coarse meal. When pressed, the dough will form a cohesive mass.
2. Turn the dough out onto a work surface and knead until the dough is very firm, yet pliable. Cover and let the dough relax at room temperature for at least 1 hour.
3. Roll the pasta dough into thin sheets and cut into fettuccine ribbons by hand or using a pasta machine. The pasta is ready to cook now, or it may be refrigerated for up to 2 days.
4. To cook, bring 1 ½ gallons of water to a rolling boil in a large saucepot. Generously salt the water using about 1 ½ tablespoons of salt (the water should be noticeably salty, but not unpleasant). Add the pasta and stir to separate the strands.
5. Cook the pasta until it is al dente, "to the tooth" - it will give slight resistance when bitten into. Drain immediately in a colander.
6. Toss the pasta with the carrot glaze to coat the strands and flavor the pasta. Serve hot.

# ORGANIC CARROT GLAZE

*Yield: 4 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Carrot juice, organic	3 cups
Honey, organic	1 Tbsp.
Bean water or vegetable stock	½ cup
Salt	to taste
Extra virgin olive oil	½ cup

## **Method**

1. Combine carrot juice, honey, and bean water or vegetable stock in a pot. Bring to a simmer.
2. Reduce the liquid by  $\frac{2}{3}$  and remove from the heat. Season with salt.
3. Place the mixture in a blender and emulsify with the olive oil on high speed.
4. Keep warm and serve over fresh pasta.

# PICKLED LENTILS

*Yield: 6 to 8 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Lentils, all kinds	2 cups
Picking jar, tall	1 ea.
Water	as needed
Bundle of herbs tied or a cheese cloth bag of spices	1 ea.
<i>Brine</i>	
White wine or white distilled vinegar	2 ½ cups
Sugar	1 cup
Salt	½ cup
Garlic cloves	4 ea.
Korean red chile flakes	1 Tbsp.
Mustard seeds	1 Tbsp.
Caraway seeds	1 Tbsp.
Water	as needed

## **Method**

1. Rinse and clean lentils.
2. Boil the lentils to al dente with your bundle of herbs or spice bag and a pinch of salt
3. Drain and let cool off on sheet pans.
4. In the meantime, boil the brine with all the ingredients for 4 to 5 min. Chill completely.
5. Add lentils to your jar and cover with the brine. Add only water if needed to have the liquid 2 - 3 inches over the top of the lentils.
6. Chill and save for up to 4 weeks in a fridge.
7. Use on cold cut charcuterie and salads as a garnish.

**Note:** If using red, small brown, or green lentils, cooking time is very short. You do not want the lentils to get more than al dente. If using black or French green, cooking time is 50% longer.

# SOCCA BLINIS WITH SPLIT PEA ROMESCO

*Yield: 24 Blinis, 4 to 6 Portions as appetizers*

*Prep time: 10 minutes*

*Total time: 25 minutes*

<b>Ingredients</b>	<b>Amounts</b>	
Chickpea flour, packed	1 cup + 3 Tbsp.	295 mL
Sea salt	1 tsp.	5 mL
Ground black pepper	½ tsp.	2 mL
Warm water	1 cup	250 mL
Olive oil (divided use)	4 - 6 Tbsp.	60 - 90 mL
White onion, thinly sliced	1 cup	250 mL
Thyme leaves (reserve some for garnish)	2 Tbsp.	30 mL
Sunflower seeds, toasted	as needed	as needed
Split Pea Romesco Sauce (recipe follows)	1x recipe	1x recipe

## **Method**

1. Place the flour, salt and pepper in a medium bowl. In a slow steady stream pour in the water in with the flour mixture while whisking continuously. Pouring the water slowly will prevent lumps from forming in the batter. Whisk in 2 tablespoons of the oil. Allow the mixture to sit for 15 minutes to thicken slightly. Additional flour can be added if a thicker blini is preferred.
2. Heat a non-stick, sauté pan on medium- high heat and add the oil. Toss in the sliced onions and cook until golden brown. Toss in the fresh thyme and stir to combine.
3. Pour the sautéed mixture with the chickpea batter and combine until well blended. Return the pan to the stovetop and add some of the remaining oil. Using a spoon pour small dollops of the batter into the pan. Cook until the edges are slightly golden and the batter begins to bubble slightly in the center. Flip and cook on the other side until done.
4. Remove from the stove, top with a dollop of the romesco and garnish with fresh thyme and toasted sunflower seeds. Enjoy immediately.

## SPLIT PEA ROMESCO SAUCE

*Yield: 4 to 6 Portions*

*Prep time: 10 minutes*

*Total time: 15 minutes*

<b>Ingredients</b>	<b>Amounts</b>		
Red pepper, roasted, chopped	1 cup	250	mL
Yellow split peas, cooked	1 cup	250	mL
Toasted almonds or sunflower seeds	½ cup	125	mL
Red wine vinegar	1 Tbsp.	15	mL
Lemon juice	1 Tbsp.	15	mL
Garlic cloves, roughly chopped	2 ea.	2	ea.
Smoked paprika	2 tsp.	10	mL
Sea salt	½ tsp.	2	mL
Cayenne	¼ tsp.	1	mL
Olive oil	2 Tbsp.	30	mL

### **Method**

1. Combine all the ingredients in the bowl of a food processor. Process until the mixture is smooth, scraping down the edges as needed.
2. Season to taste with salt and serve as a spread to accompany the prepared socca blinis.

### **Notes:**

- Split peas take approximately 25 minutes to cook in simmering water. To retain the texture of the peas cook until tender, drain and rinse under cold water. This will stop the cooking process of the peas, providing a nice tender pea that will hold up in salads and other dishes. Overcooking the peas will give a pureed texture, which is ideal for soups and dips and including in baked goods.
- Split peas in this recipe can be substituted for other cooked pulses.

## ZESTY GARDEN GAZPACHO WITH SPLIT RED LENTILS

*Yield: 6 Portions*

*Prep time: 10 minutes*

*Total time: 15 minutes + chill time*

<b>Ingredients</b>	<b>Amounts</b>	
Tomato juice	1 ¾ cup	440 mL
Red bell pepper, medium, seeds removed and chopped	1 ea.	1 ea.
Red split lentils, cooked	1 cup	250 mL
Cucumber, chopped	½ ea.	½ ea.
Roma tomatoes, small, chopped	2 ea.	2 ea.
Jalapeno, seeds removed, chopped	½ ea.	1 ea.
Shallot, small, chopped	1 ea.	1 ea.
Balsamic vinegar	2 Tbsp.	30 mL
Olive oil	3 Tbsp.	45 mL
Garlic clove, peeled	1 ea.	1 ea.
Hot sauce	2 tsp.	10 mL
Sea salt	to taste	to taste
Dill (for garnish)	as needed	as needed

### **Method:**

1. Place all ingredients (except the salt and dill) in a blender and process until smooth in consistency. Season to taste with salt and reserve in the fridge for 2-4 hours. This will help the flavors come together and develop.
2. Before serving, adjust with salt and hot pepper to taste. Garnish with fresh dill and enjoy!

### **Note:**

- To enhance the texture of the soup, reserve some of the chopped tomatoes, red pepper, cucumber, and lentils. Place them in each of the serving bowls with the soup before serving.

- Dry split red lentils take approximately 5 minutes to cook in 3 x the amount of simmering water. To retain the texture of the lentils cook until tender, drain and rinse under cold water (blanch). This will stop the cooking process, providing a nice tender lentil that will have some shape. Overcooking the lentils will give a pureed texture, which is ideal for soups and dips and including in baked goods and smoothies.

- Lentils do not require soaking and can be cooked from dry.

# DAY THREE:

## HEALTHY AND SUSTAINABLE SNACKING

### CHEF LARS

- Soup On-the-Go
  - English Curry and Yellow Pea Soup
- Lentil Falafel with Grape Raita and Pita Bread
- Bean and lentil Lasagna warm it eat it
  - Lentil and Mushroom Lasagna

### CHEF CHRISTINE

- Protein-Rich Energy Bars with Lentil Puree
  - Chilled Cocoa, Lentil, and Pepita Bites
- Sweet & Savory Trail Mix with Navy Bean Flakes
  - Citrus Navy Bean Granola
- Nutrient-Rich Plant-Forward Smoothie/Popsicles
  - Pina Colada Smoothie with White Bean Puree and Fava Bean Protein

## ENGLISH CURRY AND PEA SOUP

*Yield: 4 to 6 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Olive oil	1 Tbsp.
Apple, peeled and diced fine	2 ea.
Onion, peeled and diced	1 ea.
English-style Madagascar curry	1 - 2 Tbsp.
Vegetable stock	2 cups
Yellow peas, soaked	1 cup
Heavy cream	½ cup + more as desired
Salt	to taste

### **Method**

1. Heat oil in a small pot and sear off the apple and onions, about 4 to 5 minutes.
2. Add in curry powder and toast it all together for another 1 to 2 minutes.
3. Add chicken stock and peas and simmer with lid on for 30 minutes on low heat.
4. With a stick blender, pureé the soup with the cream and salt. Add additional cream if desired.
5. Serve in small 4 - 5 fl. oz. insulated cups to-go.

# LENTIL FALAFEL WITH YOGURT SAUCE

*Yield: 4 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Lentils, red or green	9 wt. oz.
Onion, finely grated	1 ea.
Garlic cloves, minced	4 ea.
Vegetable or chicken stock	½ cup
Oatmeal, finely ground	½ - ¾ cup
Garam masala	to taste
Salt	to taste
Ground black pepper	to taste
Cayenne (optional)	to taste
Vegetable oil, for frying	as needed
Grape Raita (recipe follows)	1x recipe
Pita Bread (recipe follows)	as needed

## **Method**

1. Boil the lentils in plain water for 30 to 35 minutes, uncovered.
2. Drain and dry in the same pot while still warm.
3. Mix the lentils with a flavorful stock, then add garlic and spices.
4. Add in the raw onions and the oatmeal. Combine.
5. Shape the mixture into a small 1 to 2 ounce patty.
6. Heat a Teflon frying pan with about ½ inch of your best neutral oil and fry them crispy on both sides.
7. Serve alongside Grape Raita and Pita Bread.

## GRAPE RAITA

*Yield: 4 to 6 Portions*

<b>Ingredients</b>	<b>Amounts</b>
Plain yogurt	3 cups
Seedless grapes, halved	1 ½ cups
Cumin, toasted, ground	2 tsp.
Sugar	2 tsp.
Cayenne or paprika	½ tsp.
<i>Tempering oil</i>	
Soybean oil	3 Tbsp.
Black mustard seeds, or cumin seeds	2 tsp.
Fennel seeds	1 tsp.
Curry leaves, frozen, torn into pieces (optional)	6 - 10 ea.
Salt	to taste

### **Method**

1. Whisk the yogurt in a bowl until smooth and aerated.
2. Stir in the grapes, and then the cumin, sugar, and cayenne or paprika.
3. Heat the oil with the mustard or cumin seeds in a small frying pan or kadai over medium-high heat. Cook until the cumin darkens or the mustard seeds crackle, 1 to 2 minutes. (Cover the pan if using mustard seeds; they crackle and pop.) Add the fennel seeds and curry leaves, if using, and cook uncovered, stirring, 5 to 10 more seconds. (Stand back if using curry leaves; they spit when they hit the hot oil.) Pour over the yogurt and chill well. Just before serving, stir in the salt.

**Note:** I recently rediscovered this delightfully unusual raita from Bukhara, a restaurant in Dehli that has the reputation amongst some as being the finest in the world. I like it best with tiny champagne grapes (if you can find them) but any seedless variety works. When I have a great deal of leisure, I peel and halve the grapes but neither is necessary. I particularly love this with a lamb or chicken biriyani.

Source: Suvir Saran, as presented at the 2011 Worlds of Healthy Flavors Conference.  
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# WHOLE-WHEAT HONEY PITA

*Yield: 24 Small or 12 Large Pitas*

<b>Ingredients</b>	<b>Amounts</b>
Whole wheat flour	2 cups
All-purpose flour, unbleached	3 ½ cups (plus more for kneading)
Warm water (90° - 110°F)	2 cups
Active dry yeast envelopes (¼ wt. oz.)	2 ea.
Honey	1 Tbsp.
Salt	2 tsp.

## **Method**

1. Combine the whole wheat and all-purpose flours in a large bowl; mix thoroughly. Set aside.
2. Pour the water into a second large bowl and sprinkle in the yeast. Stir to dissolve.
3. With a wooden spoon, stir the honey and salt into the yeast mixture; mix thoroughly. Gradually add 5 cups of the flour, stirring constantly until the dough is smooth. Slowly work in the remaining flour (up to ½ cup) with your hands, kneading until the dough is no longer sticky. Turn the dough out onto a well-floured board. Knead until it is smooth and elastic, about 5 minutes.
4. Shape the dough into an even rectangle and cut it in half lengthwise. Divide the dough into 24 portions for small pitas; 12 for larger ones. Shape each portion into a smooth ball. Place the balls on a floured surface and cover them with slightly damp towels while you roll 1 ball at a time.
5. Gently press each ball flat with your fingers, keeping it well rounded. Flour a work surface and a rolling pin. Roll each round from the center to the outer edge, giving the dough a ¼ turn after each roll, to form a perfect circle not quite ¼-inch thick (about 5 to 5 ½ inches in diameter for small pitas; about 3 ½ inches for larger ones). Carefully flip the circles over to smooth out any creases that might prevent the pocket from forming.
6. As each loaf is rolled, place it carefully on a floured surface and cover with a clean, dry towel; do not let the surface of the loaves dry out. Let the loaves rise in a warm draft-free area, 30 to 45 minutes.
7. Fifteen minutes before the loaves have finished rising, preheat the oven to 500°F. At the same time, place an ungreased baking sheet in the oven to warm.
8. To bake, place 4 small pitas or 1 large pita on the hot baking sheet. Bake on the bottom rack of the oven until puffed and lightly browned on the bottom and almost white on top, about 4 minutes for small pitas and about 3 ½ minutes for large; the pita will be soft and flexible. If desired, flip the loaves over after they have puffed and bake up to 1 minute longer to brown the tops; be careful not to let the pita get crisp and brittle.
9. Remove the hot pitas from the oven and wrap immediately in clean, dry towels until cool enough to handle. Serve warm or at room temperature.
10. Repeat this process until all the pitas are baked.

**Note:** This recipe contains a mixture of whole-wheat and all-purpose flour to create a nutty-flavored pita. Whole-wheat flour is made from the ground kernels of whole wheat and contains all the bran and the wheat germ, as well as the starchy endosperm. The high gluten content of the all-purpose flour in combination with the whole-wheat flour helps to increase the dough's elasticity. This enables it to retain the bubbles of gas from the yeast, allowing it to rise or "grow" to its fullest and form a large pocket. Because wheat germ contains oil, whole-wheat flour will go rancid; if you don't use it very often, store it in the freezer.

# LENTIL AND MUSHROOM LASAGNA

*Yield: 4 - 6 Servings*

<b>Ingredients</b>	<b>Amounts</b>
<i>Red Lentil Sauce</i>	
White mushrooms, finely chopped	16 wt. oz.
Onion, minced	1 ea.
Garlic cloves, minced	3 ea.
Red lentils, pre-cooked 12 - 14 min	10 wt. oz.
Canned tomatoes, chopped	4 cups
Tomato purée	4 wt. oz.
Vegetable stock	1 cup
Dried oregano	1 tsp.
Dried basil	1 tsp.
Smoked paprika	½ Tbsp.
Salt	to taste
Dry lasagna sheets, 10 - 12 inches	4 ea.
<i>White Sauce</i>	
Coconut milk, unsweetened 13 fl. oz. cans	2 ea.
Nutmeg	to taste
Garlic powder	to taste
Salt	to taste
Cornstarch slurry (1:1 ratio of water to starch)	1 wt. oz.

## **Method**

1. In heavy bottomed pot, heat olive oil and cook the onions, mushrooms, and garlic under high heat. After 10 to 12 minutes, add the remaining ingredients and cook again for 4 - 5 minutes.
2. At the same time, make the white sauce by heating up the coconut milk with the nutmeg, garlic powder, and salt. When it begins to boil, mix in the cornstarch slurry to bring the sauce to a thick nappé.
3. Oil a glass or ceramic lasagna pan and lay a dry lasagna sheet in the bottom. Pour ⅓ of the red sauce on top and repeat until all of the red sauce and lasagna sheets are used up. Pour the white sauce onto the top lasagna sheet.
4. Bake at 375°F until lasagna sheets are fully cooked, about 30 to 40 minutes.
5. Cut lasagna when it reaches room temperature or cool, cut, and reheat to order.

# CHILLED COCOA, LENTIL, AND PEPITA BITES

*Yield: 12 Squares*

*Prep time: 10 minutes*

*Total time: 1 hour, 10 minutes*

Ingredients	Amounts	
Pepitas, raw and shelled	¾ cup	190 mL
Coconut flakes, unsweetened, and toasted	¾ cup	190 mL
Green lentils, cooked or canned lentils, drained and rinsed	¾ cup	190 mL
Cocoa powder	3 Tbsp.	45 mL
Tahini	2 Tbsp.	30 mL
Dates, pitted, chopped	8 ea.	8 ea.
Honey	3 Tbsp.	45 mL
Sea salt	1 pinch	1 pinch
Coconut oil (solidified)	3 Tbsp.	45 mL

## Method

1. Place all but the coconut oil into the bowl of a food processor and pulse until smooth. Scrape the sides down as needed. Adjust sweetness with honey as desired.
2. Place the coconut oil in the microwave and heat until just melted. Pulse in the food processor with the mixture until fully combined.
3. Transfer the mixture into a small parchment lined pan and spread out evenly. Garnish as desired with coconut, dried fruit, etc. and chill in freezer for 1 hour. Once chilled and solid, cut into 12 pieces and enjoy!

## Notes:

- Best if served chilled.
- Canned green (whole) lentils can be used in this recipe or they can be cooked from dry.
- Dry green lentils take approximately 25 minutes to cook in approximately 3x the amount of simmering water, lid on. Once the lentils are cooked, cool entirely before using in this recipe. Dry lentils generally triple in volume when cooked.
- Lentils do not require soaking as they can be cooked from dry. Soaking does however reduce the cooking time by half.

# CITRUS NAVY BEAN GRANOLA

*Yield: 5 ½ Cups*

*Prep time: 10 minutes*

*Total time: 2 hours*

<b>Ingredients</b>	<b>Amounts</b>	
Rolled oats (56g ground flakes, and 56g whole flakes)	¼ lb.	113 g
Navy bean flakes	¼ lb.	113 g
Cranberries, dried	½ cup	125 mL
Raisins	½ cup	125 mL
Sunflower seeds, unroasted	½ cup	125 mL
Flax seeds, whole	¼ cup	60 mL
Almonds, sliced	½ cup	125 mL
Ground cinnamon	1 tsp.	5 mL
Brown sugar	¼ cup	60 mL
Butter	¼ cup	60 mL
Maple syrup	¼ cup	60 mL
Salt	¼ tsp.	1 mL
Water	3 Tbsp.	45 mL
Vanilla extract	1 tsp.	5 mL
Orange, medium, zest & juice	1 ea.	1 ea.

## **Method**

1. Preheat the oven to 350°F. Line a 12"×18" baking tray with parchment paper.
2. Combine the oats, navy bean flakes, cranberries, raisins, seeds, almonds, and cinnamon in a large bowl.
3. In a small saucepan combine the brown sugar, butter, maple syrup, salt and water. Bring to a boil and remove from the stovetop. Stir in the vanilla and orange.
4. Pour the butter mixture over the dry mixture in the bowl and combine thoroughly. Cover the bowl with saran wrap and allow to sit for 10 minutes at room temperature.
5. Pour the mixture out evenly onto the lined baking tray and bake at 350°F for 20 minutes.
6. After 20 minutes, remove the tray from the oven; reduce the heat to 250°F. Break the mixture up using a spatula. Place back into the oven for 35 minutes.
7. After 35 minutes, remove the tray from the oven; reduce the heat to 150°F. Break the mixture up using a spatula. Place back into the oven for 50 minutes.
8. After 50 minutes, turn the oven off and allow the granola to cool in the oven. Serve, or place into an airtight container and reserve.

## PINA COLADA SMOOTHIE WITH WHITE BEAN PUREE

*Yield: 6 Portions*

*Prep time: 5 minutes*

*Total time: 10 minutes*

<b>Ingredients</b>	<b>Amounts</b>	
Coconut milk	1 can	400 mL
Pineapple juice	2 cups	500 mL
Banana, ripe	1 ea.	1 ea.
Ice, crushed	1 cup	375 mL
Green yogurt, vanilla	½ cup	125 mL
Honey	2 Tbsp.	30 mL
Lime juice	1 Tbsp.	15 mL
White kidney beans	1 cup	250 mL
Fava bean protein	2 tsp.	10 mL
<i>Garnish (optional)</i>		
Lime, sliced	1 ea.	1 ea.
Coconut flakes, toasted	3 Tbsp.	45 mL

### **Method**

1. Place all ingredients in a blender and puree until smooth.
2. Pour into glasses, garnish with toasted coconut on top and a slice of lime. Serve immediately.

## HANDS-ON CREATIVE WORKSHOPS: ATTENDEE'S CHOICE

The purpose of this exercise is to allow you to experiment with using pulses to create on-the-go, healthy, sustainable snacks for various meal-replacement opportunities throughout the day.

Your assignment is to develop small bites using pulses that could be eaten on-the-go without sitting, in the car or in the workplace.

You will have our pantry of ingredients available to you as listed on the following page.

You can create as many snack items as you like within your groups.

When ready, place your plate and sign indicating the name of your dish in the center of the kitchen to be enjoyed by the group.

### MARKET BASKET EXERCISE

Each team will be able to use a wide range of items like vegetables, stocks, spices, dairy, etc. from the community storeroom (see the Community Storeroom sheet for examples of items available).

You have also been given selected fresh seafood, poultry and meats listed on the next page.

### KEEP IN MIND

- Each team will design a plate for the menu in the scenario you have been assigned, pulling inspiration from Global Flavors and/or Sustainable Snacking demonstrations.
- Develop the recipes and present one large plate of the dish for a group tasting, and present a second small (tapas-size) plate to refer during class recap
- Place your plate in the dining room with proper signs, and verbally explain your thinking behind the dish to the larger group.
- The plate will be shared with the group when ready.
- We will serve a light buffet created by the CIA support team for lunch at 12:15.
- CIA will provide a selection of eco-friendly, disposable serving ware.

## **SCENARIOS ASSIGNMENTS FOR EACH TEAM**

We will mix up the teams for this exercise, and aim to create snack foods in the segment categories as assigned below.

### **TEAM ONE**

Upscale Grocery Store / Home-Cooked Meal Replacement

### **TEAM TWO**

Café/Bakery / Breakfast or Lunch

### **TEAM THREE**

Food Truck / Quick Lunch or Dinner

### **TEAM FOUR**

University Dining / Students

### **TEAM FIVE**

Your Local Neighborhood Restaurant / Chef's Specials

### **TEAM SIX**

Sandwich Counter/Soup Shop / Entrees or Sides

## COMMUNITY STOREROOM

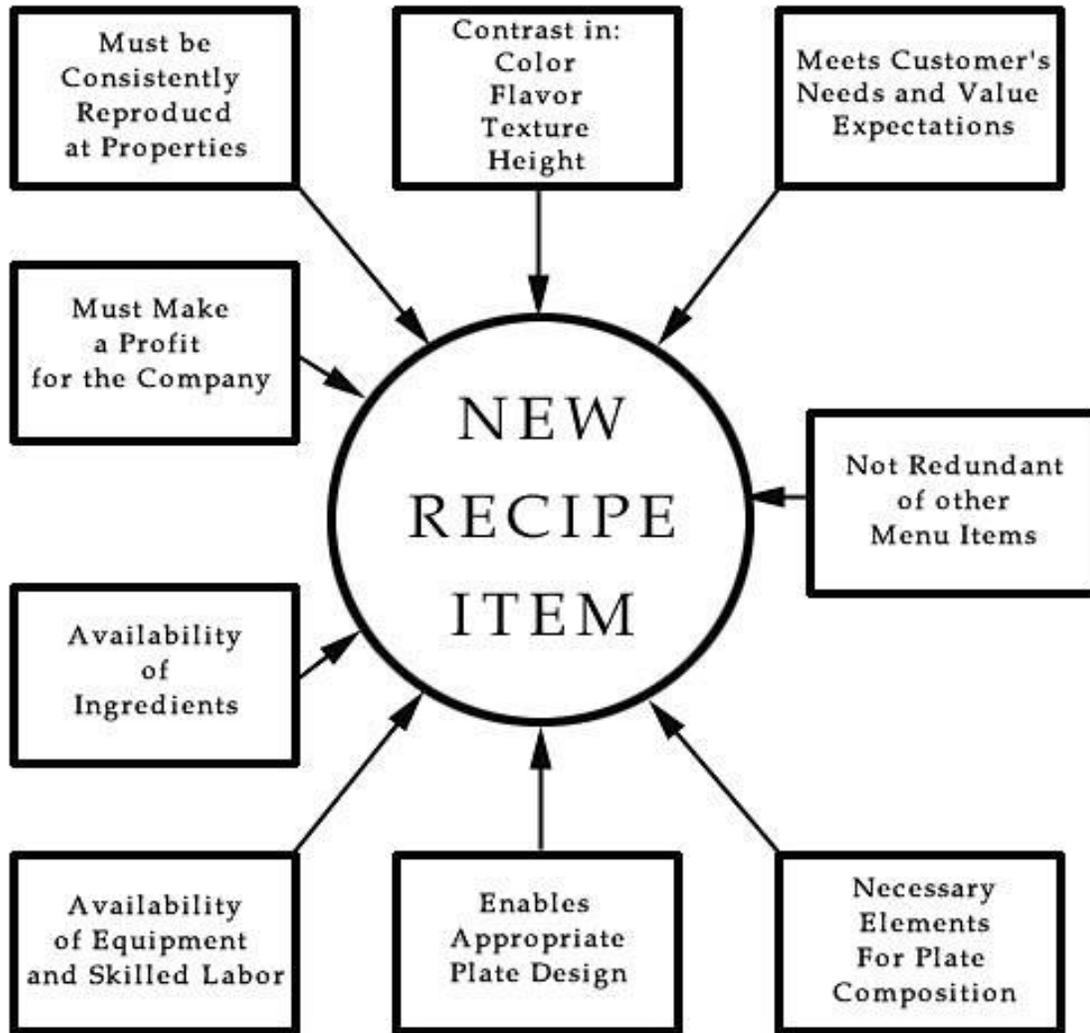
### SUPPORT TO PULSES WORKSHOP

The community storeroom, from which all participants may draw, should include, but not be limited to, most of the following items. Additional aromatics will be available in order to achieve various flavor profiles. The Chef-Instructor will be helping you.

<p><b><u>Pulses, Rice and Grains</u></b>  <i>Grains:</i> kamut, quinoa, spelt, &amp; barley</p> <p>Assorted pulses (dry beans, chickpeas, lentils and dry peas raw and in various soaked and/or cooked stages)</p> <p><i>Rice:</i> basmati, jasmine, basmati, &amp; arborio</p>	<p><b><u>Dried Fruits and Nuts</u></b>            Almonds            Pine nuts            Pepitas            Peanuts            Sesame seeds            Tamarind paste</p>	<p><b><u>Dairy</u></b>            Butter            Sour cream            Cream            Eggs            Yogurt            Parmesan cheese            Melting cheese            Cheddar            Milk            Cream            Feta            Cottage</p>
<p><b><u>Wine/Vinegar/Sauce/Oil</u></b>            Rice wine vinegar            Red wine vinegar            Balsamic vinegar            Sherry vinegar            Champagne vinegar            Red wine            White wine            Mirin            Extra-virgin olive oil</p>	<p>Tamari/Soy sauce            Madeira            Brandy            Fish sauce            Harissa            Pomegranate molasses            Sambal            Sesame oil            Capers/olives</p>	<p><b><u>Stocks</u></b>            Chicken            Veal            Fish</p>
<p><b><u>Specialty</u></b>            Arbol chilies            Ancho chilies            Chipotle</p>	<p><b><u>Flour</u></b>            Corn meal            Corn starch            Polenta            Brown sugar            Flour            Panko            Chickpea flour</p>	<p><b><u>Miscellaneous</u></b>            Dijon mustard            Tabasco            Steak sauce            All spices on spice rack            Flour tortilla            Corn tortilla            Rice paper</p>

<u>Fruits</u>	<u>Herbs</u>	<u>Protein</u>
Lemons	Various, from CIA gardens	Chicken breast
Limes		Smoked turkey
Oranges		Ground beef and pork
Onions		Smoked ham
Garlic		Bacon
Carrots		Flank steak
Celery		Sausage selection
Potatoes		Salmon
Squash (hard and soft)		Shrimp
Peppers (fresh green, red and yellow)		Mahi Mahi
Hot peppers (serrano, jalapeño and Thai)		<u>Global Ingredients</u>
Basil		Indian Papadum
Cilantro		Wonton wrapper
Parsley		Spring roll wrapper
Tomato (small and large)		Tortilla chips
Kale (regular and black)		Plantain chips
Spinach		Taro root chips
Scallions		Flat bread
Broccoli		Pita bread
Cauliflower		Rye bread
Mushrooms (white and brown)		Pizza dough
Avocado		Nori paper
Mixed lettuce		Kimchee
Cucumbers		Korean chili paste
Radish		Banana leaves
Grapes		Corn husk
		Crisp wheat crackers
		Indian spices
		Coconut milk

## RECIPE DEVELOPMENT CRITERIA



## RECIPE DEVELOPMENT TEMPLATE

**RECIPE NAME:**

Ingredients (List in order used)	Preparation (Cut, size, cooked, drained, etc.)	Weight	Volume

### Method

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

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# USA Dry Peas, Lentils and Chickpeas: The Exceptional Food Ingredients



**Scotch Green Split Peas:** green seed coat; green cotyledon



**Yellow Split Peas:** yellow seed coat; yellow cotyledon



**Lentils 'Crimson':** reddish-brown seed coat; red cotyledon



**Lentils 'Crimson':** decorticated; red cotyledon



**Lentils 'Red Chief':** decorticated; red cotyledon



**Scotch Green Pea Chips:** green seed coat; green cotyledon



**Yellow Split Pea Chips:** yellow seed coat; yellow cotyledon



**Lentils 'Morton':** tan seed coat; red cotyledon



**Lentils 'Pardina':** speckled grey/brown seed coat; yellow cotyledon



**Lentils 'Regular':** light brown, mottled seed coat; yellow cotyledon



**Dry Green Peas 'Scotch':** light green seed coat; dark green cotyledon



**Dry Yellow Peas:** light yellow seed coat; deep yellow cotyledon



**Lentils 'Eston':** tan to green seed coat; yellow cotyledon



**Lentils 'Richlea':** yellowish green seed coat; yellow cotyledon



**Lentils 'Large Green':** green seed coat; yellow cotyledon



**Marowfat Peas:** light green seed coat; dark green cotyledon



**Austrian Winter Peas:** mottled dark green/brown seed coat; yellow cotyledon



**Chickpeas 'Desi type':** dark brown seed coat; yellow cotyledon



**Chickpeas 'Kabuli type':** small caliber; creamy-white seed coat; yellow cotyledon



**Chickpeas 'Kabuli type':** creamy-white seed coat; golden yellow cotyledon

Pulses (dry peas, lentils and chickpeas) have many qualities that make them attractive to food manufacturers.

## Composition

- High protein, dietary fiber, starch, amylose, and amylopectin
- Low fat; low cholesterol

## Nutrition

- High protein (20 to 30% on dry weight basis)
- Low calorie
- Good complement of B-vitamins and some vitamin A
- Good complement of minerals, especially calcium and iron
- High lysine

## Functional properties

- Variety of colors—green, yellow, red, orange
- Minimal non-enzymatic browning and oil absorption during frying
- Neutral flavor; excellent flavor carrier
- Crisp, crunchy texture potential
- Protein functionality provides: good water holding capacity (WHC), good solubility, good emulsifying properties, good lipid affinity and foam stability, promising expansion/extrusion potential

**Applications** for dry pulse products include:

- Fried, toasted, baked and extruded snack foods
- Whole peas for snacks, dry soup mixes, salad topping mix
- Green or yellow pea flour for soups, instant dry soup mixes, thickening agent, dips, broth

## Lentils

- Fried, toasted, baked and extruded snack foods
- Crushed lentils for instant dry soup mixes, lentil & rice/couscous/pasta entrees, Middle Eastern/Indian specialty cuisines

## Chickpeas

- Fried, toasted, baked and extruded snack foods
- Chickpea flour for instant dry soup mixes, thickening agent, dips, broth, Middle Eastern specialty cuisines; hummus, falafel

## Pulse Flakes and Flours



### USA Dry Peas

Nutrition Facts	
Serving size	(98g)
Amount per serving	
<b>Calories</b>	<b>120</b>
	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 21g	8%
Dietary Fiber 8g	29%
Total Sugars 3g	
Includes 0g Added Sugars	0%
<b>Protein 9g</b>	
Vitamin D 0mcg	0%
Calcium 14mg	2%
Iron 1mg	6%
Potassium 355mg	8%

### USA Lentils

Nutrition Facts	
Serving size	(99g)
Amount per serving	
<b>Calories</b>	<b>110</b>
	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 20g	7%
Dietary Fiber 8g	29%
Total Sugars 2g	
Includes 0g Added Sugars	0%
<b>Protein 9g</b>	
Vitamin D 0mcg	0%
Calcium 19mg	2%
Iron 3mg	15%
Potassium 365mg	8%

### USA Chickpeas

Nutrition Facts	
Serving size	(82g)
Amount per serving	
<b>Calories</b>	<b>130</b>
	% Daily Value*
Total Fat 2g	3%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 5mg	0%
Total Carbohydrate 22g	8%
Dietary Fiber 6g	21%
Total Sugars 4g	
Includes 0g Added Sugars	0%
<b>Protein 7g</b>	
Vitamin D 0mcg	0%
Calcium 40mg	4%
Iron 2mg	10%
Potassium 239mg	6%



**USA Dry Pea & Lentil Council**

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### AGT Foods

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### Cedar's Mediterranean Foods

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### Inharvest

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W: [www.senecafoods.com](http://www.senecafoods.com)

### Healthy Food Ingredients

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Fargo, ND 58104  
P: 844-275-3443  
F: 701356-4102  
E: [info@HFfamily.com](mailto:info@HFfamily.com)  
W: [www.HFfamily.com](http://www.HFfamily.com)

## Timeless Seeds, Inc.

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Conrad, MT 59425  
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F: 406-278-5720  
E: david@timelessfood.com  
W: www.timelessfood.com

## Trinidad Benham Inc.

Richard Duty  
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Denver, CO 80237  
P: 303-220-1400  
F: 303-220-1490  
E: rduty@trinidadbenham.com  
W: www.trinidadbenham.com

## Valley Snack Foods

Dan Gall  
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Stockton, CA 95213  
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E: dan@valleysf.net

## Woodland Foods

Paul Nagy  
3751 Sunset Ave.  
Waukegan, IL 60087  
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F: 847-625-5050  
E: purchasing\_dept@woodlandfoods.com  
W: www.woodlandfoods.com

## Lentil Manufacturers

### 13 Foods

Frozen Pardina

### Inharvest

Black Beluga  
Petite Crimson

French Green

### Healthy Food Ingredients

Black Beluga

French Green

Large Green

Red

Organic Black Beluga

Organic Large Green

Organic French Green

Organic Red

### Timeless Seeds, Inc.

Organic

Black Beluga

Green

Petite Crimson

Sunrise Red

Harvest Gold

French Style

Pardina

### Woodland Foods

Green

Petite

Petite Golden

Brown

Black

Organic Green

Organic French Green

Organic Brown

Urud Dal

French Green

Ivory White

Red Chief

Organic Split Crimson

Petite Split Crimson

Autumn Lentil

## Pea Manufacturers

### 13 Foods

Frozen Kabuli

### AGT Foods

Canned

Dried

### C and F Foods, Inc.

Chickpeas

Organic

### Healthy Food

#### Ingredients

Chickpea Flakes,

Chickpea Granules,

grits & meal

Organic

### Timeless Seeds, Inc.

Organic Yellow Split

### Woodland Foods

Yellow Split

Chana Dal

Pigeon

Green Split

Organic Black-eye

Organic Yellow Split

Organic Whole-Yellow

Organic Granulated Yellow

Freeze Dried Peas

Yellow Whole

Green Whole

Black-Eyed

Split Red

Organic Split Green

Organic Whole Green

Organic Whole-Yellow

Organic Granulated Yellow

Freeze Dried Peas

### Inharvest

Split-baby garbanzos

### Seneca Foods

Canned

Organic

### Timeless Seeds, Inc.

Organic Black Kabuli

### Woodland Foods

Dry Roasted Chickpeas

Dried Garbanzos

Garbanzo Powder

Black

Garbanzos

## Chickpea Manufacturers

## Lentil Ingredients

AGT Foods  
Organic Flour

Fiberich Technologies Inc.  
Precooked Flour

Raw Flour

Harvest Innovations  
Precooked Flour

Raw Flour

Mid America Food Sale, Ltd

Protein  
Flours

Pre-Gel Flours

Organic  
Whole/splits

Crisp

Inland Empire Foods, Inc.

Precooked Flour

Flakes

Healthy Food Ingredients

Flakes

Powder

## Pea Ingredients

AGT Foods

Organic Pea Protein

Organic Flour

Organic Starch

Fiberich Technologies Inc.

Precooked Flour

Fiber

Raw Flour

Starch

Harvest Innovations

Precooked Flour

Egg Replacement

Raw Flour

Inland Empire Foods, Inc.

Precooked Flour

Flakes

Mid America Food Sales, Ltd.

Fiber

Protein

Healthy Food

Ingredients

Powder

Flakes

Woodland Foods

Yellow Pea Powder

Green Pea Powder

Granulated Split Yellow Peas

Mid America Food Sale, Ltd

Protein

Flours

Organic

Crisp

Fiber

Starch

Pre-Gel Flour

Whole/Splits

## Chickpea Ingredients

Fiberich Technologies Inc.

Precooked Flour

High Fiber Flour Concentrate for Bakery Goods

Raw Flour

Harvest Innovations

Precooked Flour

Raw Flour

Inland Empire Foods, Inc.

Precooked Flour

Woodland Foods

Garbanzo Bean Powder Organic

Garbanzo Bean Powder Cooked

Garbanzo Bean Powder

Granulated Garbanzo Beans

## Lentil Finished Product

AGT Foods

Lentil products

Cedar's Mediterranean Foods

Lentil Salad

Red Pepper Lentil Hummus

Inharvest

Jade Blend

MXO Global, Inc.

Organic Red Lentil

-Rotini

-Penne

-Mini Fettuccine

Organic Green Lentil

-Elbow

Red and Green Lentil

Black Bean

Inland Empire Foods, Inc.

conventional & organic

Lentil Whole (precooked & dried -

simmer applications

Lentil Flake (precooked & dried) -

dips, soups, snacks, toppings, RTE

Lentil Flour - fully cooked

N.K. Hurst Company

Confetti Lentil Supreme

Garlic & Herb Lentils

## Pea Finished Product

N.K. Hurst Company

Green Split Pea with Ham Flavor

Soup

Roquette America Inc.

Contact directly for product available

Inland Empire Foods, Inc.

conventional & organic

Gr & Yw Whole Splits (precooked &

dried) - simmer applications

Gr & Yw Pea Flake (precooked &

dried) - dips, soups, snacks, toppings,

RTE

Gr & Yw Pea Flour - fully cooked

## Chickpea Finished Product

Cedar's Mediterranean Foods

Chickpea Salad

Hummus

-Artichoke Kalamata -Chipotle

-Classic Original -Avocado

-Roasted Red Pepper -Garlic Lovers

-Artichoke Spinach -Wasabi

-Roasted Eggplant -Zesty Lemon

-Garden Vegetable -Edamame

-Roasted Garlic & Chive

-Sundried Tomato Basil

-Roasted Red Chili Pepper

-Red Pepper Lentil

Creative Food Innovations, LLC

Go Bonzo's, Roasted and Seasoned

Chickpeas

-Cool Ranch

-Lightly Salted

-Chili-Citrus

-Spicy Nacho

-French Toast

-Sriracha

Inharvest

Golden Jewel blend

Jade blend

Jasmine Blend

Kronos Foods Corp.

Falafel

Hummus

-Classic -Roasted Red Pepper

-Roasted Garlic -Chipotle

Inland Empire Foods, Inc.

conventional organic

Chickpea Whole (precooked & dried) -

simmer applications

Chickpea Flake (precooked & dried) -

dips, soups, snacks, toppings, RTE

Chickpea Flour - fully cooked

## Pulse Fractions and Ingredients – 2017

### Dry Peas

### Lentils

### Chickpeas

	Pre-cooked flour	Raw flour	Fiber	Protein	Starch	Powder	Flakes	Granules, grits & meal	Pre-cooked flour	Raw flour	Fiber	Protein	Starch	Powder	Flakes	Granules, grits & meal	Pre-cooked flour	Raw flour	Fiber	Protein	Powder	Flakes	Granules, grits & meal	
<b>AGT Foods</b> 1611 E. Century Ave. Suite 102 Bismarck, ND 58503 701-751-1623 <a href="http://www.agtfoods.com">www.agtfoods.com</a>	●	●	●	●	●	●		●	●	●	●	●	●	●		●	●	●	●	●	●		●	
<b>Fiberich Technologies, Inc.</b> 10200 5th Ave S Bloomington MN 55420 952-920-8054 <a href="http://www.fiberichtech.com">www.fiberichtech.com</a>	●	●	●		●				●	●							●	●						
<b>Harvest Innovations</b> 1210 North 14th St. Indianola, IA 50125 515-962-5063 <a href="http://www.harvest-innovations.com">www.harvest-innovations.com</a>	●	●		●					●	●							●	●						
<b>Inland Empire Foods, Inc.</b> 5425 Wilson St. Riverside, CA 92509-2434 951-682-8222 <a href="http://www.inlandempirefoods.com">www.inlandempirefoods.com</a>	●					●	●	●	●					●	●	●	●					●	●	●
<b>InfraReady Products</b> 1438 Fletcher Road Saskatoon, SK S-1 T 2 Canada 306-242-4950 <a href="http://www.infrareadyproducts.com">www.infrareadyproducts.com</a>	●						●	●	●						●	●	●					●	●	
<b>Roquette America, Inc.</b> 2000 S. Batavia Ave. Suite 400 Geneva, IL 60134 630-463-9447 <a href="http://www.roquette.com">www.roquette.com</a>			●	●	●																			



# USA Dry Pea & Lentil Council

2780 W Pullman Rd • Moscow ID 83843  
 208-882-3023 • [www.usapulses.org](http://www.usapulses.org)

## Pulse Fractions and Ingredients – 2017

### Dry Peas

### Lentils

### Chickpeas

	Pre-cooked flour	Raw flour	Fiber	Protein	Starch	Powder	Flakes	Granules, grits & meal	Pre-cooked flour	Raw flour	Fiber	Protein	Starch	Powder	Flakes	Granules, grits & meal	Pre-cooked flour	Raw flour	Fiber	Protein	Powder	Flakes	Granules, grits & meal	
<b>Healthy Food Ingredients</b> 4666 Amber Valley Pkwy Fargo, ND 58104 844-275-3443 <a href="http://www.HFfamily.com">www.HFfamily.com</a>	●	●				●	●	●	●	●				●	●	●	●	●				●	●	●
<b>Woodland Foods, Inc.</b> 2011 Swanson Court Gurnee, IL 60031 847-625-8600 <a href="http://www.woodlandfoods.com">www.woodlandfoods.com</a>						●		●	●								●					●		●

# PULSES



## THE FUTURE OF FOOD

# PULSES



# CHICKPEAS

## Ingredients and Applications

Chickpeas (i.e. Garbanzo Beans) (*Cicer arietinum*), like all pulses, are members of the subfamily *Faboideae* of the family *Fabaceae*. Thought to have been first grown in Mesopotamia up to 7,500 years ago, there are two types of chickpeas: Desi and Kabuli.

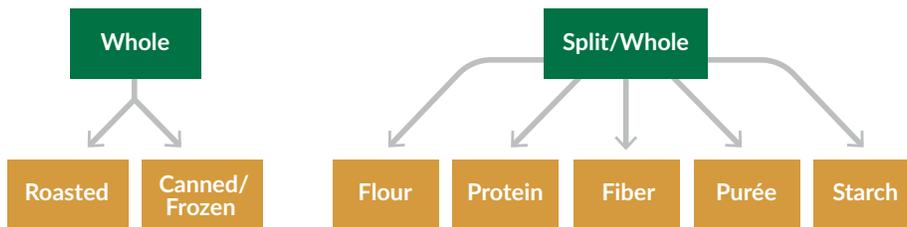
The classification is based on seed size, color and the thickness and shape of the seed coat. Desi types tend to be smaller, angular seeds with thick seed coats that range in color from light tan and speckled to solid black. If intended for human food, they require a specialized seed-coat removal process called decortication. This process requires adjusting the moisture level of the seeds to facilitate the mechanical removal of the thick seed coat, after which the seeds resemble a small yellow pea. Kabuli types, also known as garbanzo beans in the U.S., have larger seeds with paper-thin seed coats that range in color from white to pale cream to tan, which do not need to be removed before consumption.



Desi Type Chickpeas



Kabuli Type Chickpeas



## Nutrition Facts

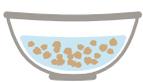
### CHICKPEAS, ¼ CUP DRY

Calories	180
Total Fat	3g
Saturated Fat	0g
Cholesterol	0mg
Sodium	10mg
Potassium	438mg
Total Carbohydrate	30g
Dietary Fiber	9g
Trans Fat	0g
Sugars	5g
Protein	10g

## FRYING OR ROASTING

Due to their high protein and low fat content, fried or roasted chickpeas are sold worldwide as a healthy alternative to other snack foods. In chickpea snack production, variety selection is key, as size, preparation time and other characteristics range greatly between varieties. The Kabuli offers a less wrinkled surface and generally requires less time to cook than the Desi. It also contains a seed coat that is very thin, but adheres well to the cotyledons. Before frying or roasting, chickpeas should be soaked for 10 hours in water that is held at room temperature. After soaking, the chickpeas are rinsed and drained to remove any excess surface water.

**1 SOAK** in room temperature water for 10 hours



**2 RINSE and DRAIN**



**3 FRY** at 356°F/180°C or **ROAST** at 212-266°F/100-130°C



## FLOUR

Chickpea flour has a mild, neutral flavor which makes it suitable for baking applications. Both raw and pre-gelatinized flour are available depending on the use.

- **Raw (split/whole)**

Anti-nutritive factors in chickpea flour such as polyphenols, phytic acid and trypsin inhibitors, along with flavor, can limit the use of chickpea flour as an ingredient, especially in applications that go through less extensive heat treatment, like bakery and meat products. Chickpeas and other pulses can be treated to reduce the content of these anti-nutritive factors, and to improve the flavor and nutritional value of the ingredient.

- **Pre-gelatinized (split/whole)**

Treating raw pulse flour by heating partially gelatinizes the starches, inactivates enzymes, increases shelf life and improves flavor. These attributes make pre-gelatinized pulse flour suitable for some applications. The differences in gelatinization temperatures among flours from different pulses are attributed to differences in size, form, distribution of starch granules in the flours and to the internal arrangement of starch within the granule. Low protein and high amylose starches require high inputs of energy to undergo starch gelatinization. Low amylopectin starch has a higher gelatinization temperature, and is more resistant to enzyme and acid digestion compared to other starches. Pre-gelatinized chickpea flour serves as an effective flavor carrier, ideal for making more nutritious flatbreads, tortillas, pita breads, crackers, cookies, energy bars and extruded snacks. It also enhances dough yield, firmness and texture.

In general, pre-gelatinized flour is ideal for baking applications. Similar to flours derived from other pulses, using chickpea flour in baking applications provides nutritional benefits, including increased fiber, protein, micronutrients and better complimentary amino acid profile when used with wheat flour. Furthermore, chickpea flour in baking applications impacts functionality by increasing water absorption, thus increasing dough yield, increasing viscosity and altering the flavor characteristics of finished products.

- TIPS:**
- *Pre-gelatinized flour provides more neutral flavor*
  - *Use of additional ingredients (spices, cocoa, fruits, etc.) complements the flavor*
  - *Addition of chickpea ingredients increases the viscosity of batter or dough*
  - *Add water, as chickpea flour absorbs more water than wheat and other flours*

## EXTRUDED SNACKS

Chickpeas contain a high amount of fat (~6%) relative to other pulses. For this reason, they are often best-paired with corn, rice and other starch sources in the making of extruded snacks, as too high a proportion of chickpea flour in a formula (70-100%) can cause the dough to slip inside the extrusion barrel and prevent expansion.

**Factors affecting extrusion include:**

- **Protein, fiber, and fat content** – may lower expansion
- **Particle size** – may affect expansion by changing hydration and gelatinization properties
- **Type of starch** – may affect expansion by changing gelatinization properties, especially amylose and amylopectin content
- **Raw or pre-gelatinized flour** – Pre-gel flour may alter gelatinization properties during cooking

### SAMPLE PULSE SNACK BASE FORMULA

<b>Pulse grits (30-60 mesh)</b>	<b>60%</b>
<b>Corn grits</b>	<b>39.5%</b>
<b>Calcium carbonate</b>	<b>0.5%</b>
<b>Final moisture</b>	<b>10-15%</b>
<b>Additional dye and seasoning</b>	

### CHICKPEA FLOUR ANALYSIS (Value Per 100 Grams)

NUTRIENTS	CHICKPEA	% DAILY VALUE
Calories (kcal)	387.0	
Calories from Fat (kcal)	60.0	
Fat (g)	6.69	10
Saturated Fat (g)	.693	3
Trans Fatty Acid (g)	0.0	
Cholesterol (mg)	0.0	
Sodium (mg)	64.0	3
Carbohydrates (g)	57.82	19
Dietary Fiber (g)	10.8	43
Total Sugars (g)	10.85	
Protein (g)	22.39	45
Calcium (mg)	45.0	5
Iron (mg)	4.86	27
Potassium (mg)	846.0	24
Zinc (mg)	2.81	19
Vitamin A - IU (IU)	41.0	1
Vitamin C (mg)	0.0	
Thiamin (mg)	.486	32
Riboflavin (mg)	.106	6
Niacin (mg)	1.762	9
Vitamin B-6 (mg)	.492	25
"Folate, total (mcg)"	437	109

Compiled from the data provided by USDA database and ESHA Genesis SQL software



For more information, contact: **USA Dry Pea and Lentil Council/ American Pulse Association**  
[info@usapulses.com](mailto:info@usapulses.com) | **208-882-3023** | [www.usapulses.com](http://www.usapulses.com)

# PULSES



## DRY BEANS

### *Ingredients and Applications*

Dry beans come in a variety of colors and sizes. Beans are found around the world, originating in several different locations. The common bean (*Phaseolus*), including kidney, pinto, navy, lima and others, originates in South America, the Andes and central America. Sub-tropical beans such as adzuki, mung and blackeye peas (*Vigna*) originated in Africa, while broad beans such as fava/faba beans (*Vicia faba*) are thought to have originated in the Fertile Crescent region.



Adzuki



Black



Blackeye Peas



Kidney  
Dark Red



Kidney  
Light Red



Great  
Northern



Navy



Pinto



Fava



Small Red



Mung



Lima



Cranberry

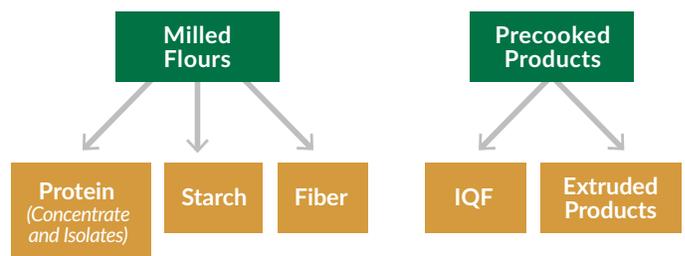


Pink

## PROCESSING

Beans are treated similarly to other pulses like peas, lentils and chickpeas. Beans must be soaked prior to cooking. Common methods for cooking beans include canning, pressure cooking, or adding beans to soups. Add any acidic ingredients or those containing calcium or salt after beans have finished cooking, as these can prevent beans from becoming tender while cooking. While adding a small amount of baking soda to cooking water can help beans tenderize more quickly, in excess it negatively affects the flavor of beans and can destroy B-vitamins.

### Value Added Bean Products



## FLOUR

Dry beans can be milled into flour just like dry peas, lentils and chickpeas. White bean, black bean, and fava bean flours are currently used for gluten-free baking. In a study conducted at Northern Crops Institute, great northern bean flour was used to fortify control bread at 30% and increased the water from 66% in the control to 74% with added bean flour. Differences between raw and pre-gelatinized flours are flavor and functionalities and come from heat processing before milling. Bean flour is mostly available as a whole flour and in pre-gelatinized form.

- **Raw (whole)**

Anti-nutritive factors in bean flour such as polyphenols, phytic acid and trypsin inhibitors, and color and flavor can limit the use of bean flour as an ingredient in bakery products, meat products and snack foods. Legumes can be treated to reduce the content of these anti-nutritive factors, to improve the nutritional value of the protein and remove their bean flavor. Hull of beans are tightly adhered to cotyledons, thus difficult to be removed. Therefore, available bean flour in the market is mostly made from whole beans.

- **Pre-gelatinized (whole)**

Treating raw pulse flour by heating partially gelatinizes the starches, inactivates enzymes, increases shelf life and improves flavor. These attributes make pre-gelatinized pulse flour favorable to raw pulse flour. The differences in gelatinization temperatures among flours from different pulses are attributed to differences in size, form, distribution of starch granules in the flours and to the internal arrangement of starch within the granule. Pregel bean flour serves as an effective flavor carrier and flavor improver, ideal for making more nutritious flatbreads, tortillas, pita breads, crackers, cookies, energy bars and extruded snacks. It also enhances dough yield, firmness and texture.

## EXTRUSION

Extrusion is a mechanical process in which materials are forced, under pressure, through a die opening to create products of a desired shape, size and/or texture. Due to its processing flexibility, extrusion cooking produces an incredibly broad range of food products in the cereal, dairy, bakery and confection industries. Pulse flours are often used as the basis for formulations that are extruded in low pressure systems. The flour is often mixed with starchy ingredients, like rice flour, to increase a starch level which enables ideal expansion. Extruded pulse-based products offer a crunchy texture, usually in the form of snacks and breakfast cereals, in a variety of shapes. Extrusion also can be used to produce pre-gelatinized flour by milling the extrusion overs back into flour.

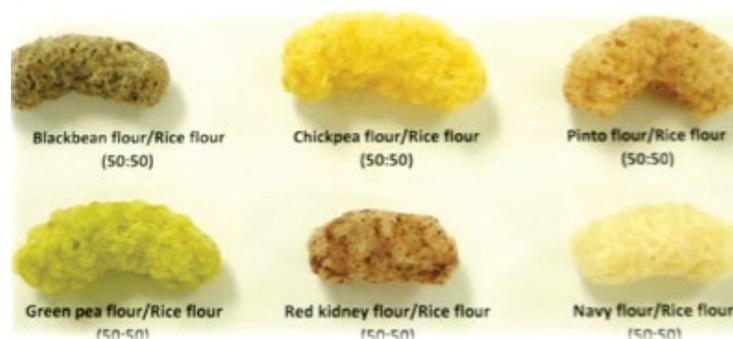


Photo: Northern Pulse Growers Association

## BAKING

The majority of the commercially available bean flour is pre-gelatinized, which makes it suitable for baking application. Wide varieties of bean flour enable the manufacturers to experiment with different types of beans for different baked goods. For example, when used in neutral flavored products such as vanilla cakes, white bean or navy bean flour is a good choice. On the other hand, black beans are favorable when used in brownies and chocolate cakes. Apart from the color, the neutral flavor of bean flour provides advantages as an ingredient.

## FRACTIONATION

Starch, protein and fiber can be fractionated in the same manner as pea fractionated products. However, because the outer hull of beans is harder to remove than some other pulses (like dry peas and lentils), some fractionations from beans are less common, like fiber, while others are more common, like bean starch, which can be used to make noodles. This affects the commercial applications and products available.

< *Red Bean, Black Bean Extruded Products*

Photo: Northern Pulse Growers Association

**TIP: Applications determine which flour to use. Know the application!**



For more information, contact: **USA Dry Pea and Lentil Council/ American Pulse Association**  
[info@usapulses.com](mailto:info@usapulses.com) | 208-882-3023 | [www.usapulses.com](http://www.usapulses.com)

# PULSES

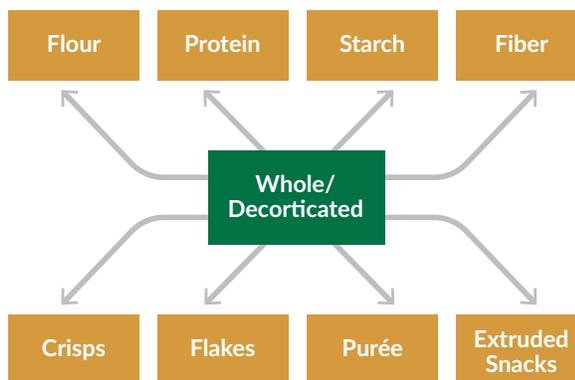


# DRY LENTILS

## *Ingredients and Applications*

Lentils (*Lens Culinaris*), named for their characteristic lens shape, are a member of the pulse family that offer a range of nutritional benefits and culinary applications.

There are a wide variety of lentils, in colors including yellow, red-orange, green, brown and black. Red, white and yellow lentils have their skins removed in a process called decortication. Many lentil types come in large and small varieties and are sold in many forms, with or without the skins, whole or split.



## COOKING

Cooking lentils is relatively easy compared to other pulses. Soaking is not necessary and cooking takes a shorter time than many other pulses, ranging from 5 to 40 minutes. Cooked lentils can be stored in the refrigerator or freezer for later use.

### Canning

Canning processes vary according to variety, size and period of maturation of pulses. Canned lentils can be found in most grocery stores, which can be a convenient option for meal preparation and baking use.

### Frying or Roasting

Lentils are soaked for three hours in water that is held at room temperature. Lentils are then rinsed and drained to remove excess water. When fried, lentils perform differently than dry peas or chickpeas. Because lentils are not as susceptible to thermal shock, a single temperature zone may be used. A temperature of 356 degrees F (180 degrees C) is used to quickly decrease the moisture content in the lentils. The required frying time tends to be very short. Final moisture after frying should be 1-2%.

**1** SOAK in room temperature water for 3 hours



**2** RINSE and DRAIN



**3** FRY at 356°F/180°C or ROAST at 257°F/125°C



Green



Red



Small Brown



French Green



Black

## FLOUR

Lentil flour available in the market includes raw and pre-gelatinized. Lentil flour has very neutral flavor, thus raw flour may be used in most applications. Pre-gelatinized lentil flour serves as an effective flavor carrier, ideal for making more nutritious flatbreads, tortillas, pita breads, crackers, cookies, energy bars and extruded snacks. It also enhances dough yield, firmness and texture.

- **Raw (split/whole)**

Anti-nutritive factors in lentil flour such as polyphenols, phytic acid, and trypsin inhibitors, and color and flavor can limit the use of lentil flour as an ingredient in applications, especially those that go through less extensive heat treatment. Pulses can be treated to reduce the content of these anti-nutritive factors, to improve the nutritional value of the protein and remove strong flavors.

- **Pre-gelatinized (split/whole)**

Treating raw pulse flour by heating partially gelatinizes the starches, inactivates enzymes, increases shelf life and improves flavor. These attributes make pre-gelatinized pulse flour suitable for some applications. The differences in gelatinization temperatures among flours from different pulses are attributed to differences in size, form, distribution of starch granules in the flours and to the internal arrangement of starch within the granule.

*TIP: Applications determine which flour to use. Know the application!*

## FRACTIONATION

Lentils can be fractionated into starch, protein and fiber in the same manner as pea fractionated products. However, fractionation from lentils is less common compared to pea sources, and there are few commercial products available.

### SAMPLE PULSE SNACK BASE FORMULA

Pulse grits (30-60 mesh)	60%
Corn grits	39.5%
Calcium carbonate	0.5%
Final moisture	10-15%
Additional dye and seasoning	

## EXTRUDED SNACKS

Extrusion is a mechanical process in which materials are forced, under pressure, through a die opening to create products of a desired shape, size and/or texture, creating many products in the cereal, dairy, bakery and confection industries, like chips and puffs. Lentils can be extruded at formula rates up to 100%; however, high formula rates result in a dense product. Addition of corn, rice and other starch sources can aid in the expansion of the pulse snacks.

### Factors affecting extrusion are:

- **Protein, fiber and fat content** – may lower expansion
- **Particle size** – may affect expansion by changing hydration and gelatinization properties
- **Type of starch** – may affect expansion by changing gelatinization properties, especially amylose and amylopectin content
- **Raw or pre-gelatinization flour** – Pre-gelatinized flour may alter gelatinization properties during cooking

### LENTIL FLOUR ANALYSIS (Value Per 100 Grams)

NUTRIENTS	LENTILS	% DAILY VALUE
Calories (kcal)	353.0	
Calories from Fat (kcal)	10.0	
Fat (g)	1.06	2
Saturated Fat (g)	.156	1
Trans Fatty Acid (g)	0.0	
Cholesterol (mg)	0.0	
Sodium (mg)	6.0	0
Carbohydrates (g)	60.08	20
Dietary Fiber (g)	30.5	122
Total Sugars (g)	2.03	
Protein (g)	25.8	52
Calcium (mg)	56.0	6
Iron (mg)	7.54	42
Potassium (mg)	955.0	27
Zinc (mg)	4.78	32
Vitamin A - IU (IU)	39.0	1
Vitamin C (mg)	4.4	7
Thiamin (mg)	0.873	58
Riboflavin (mg)	0.211	12
Niacin (mg)	2.605	13
Vitamin B-6 (mg)	0.54	27
"Folate, total (mcg)"	479.0	120

Compiled from the data provided by USDA database and ESHA Genesis SQL software



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# PULSES



## DRY PEAS

### Ingredients and Applications

Cultivated peas are classified into two types: garden peas (*Pisum sativum ssp. hortense*), which are identified by the wrinkled nature of their seed and cotyledon, and field peas (*Pisum sativum ssp. arvense*), also known as dry peas. This second type is distinguished by its smooth seed surface. The two types are genetically different and produce starches with different granular morphologies and characteristics.

The two most common varieties of dry peas are green and yellow peas. Split peas are simply dry peas (green, yellow or red) that have been split. Green split peas have a stronger flavor than yellow split peas, which have a milder, slightly sweet flavor.



Whole Green Peas



Split Green Peas



Yellow Whole Peas

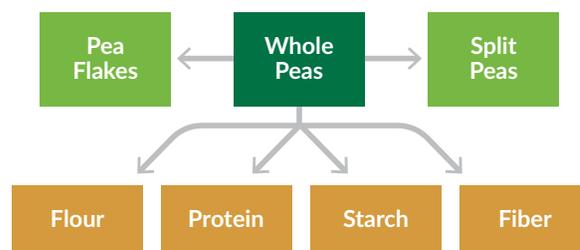


Yellow Split Peas

## APPLICATIONS

Dry peas can be hydrated by soaking, and then either cooked, canned or frozen. Applications for canned or frozen peas include soups, stir-fry dishes, pot pies, salads and casseroles. Most dry peas are put through the splitting process and the split peas are then used in the popular North American dish, split pea soup. In many Asian countries, peas are roasted, salted and consumed as snacks. In parts of the Mediterranean, they are added to meat and potatoes to make a hearty stew.

Dry pea flour also has many uses worldwide. It is valued not only as a vegetable protein source, but also, in part, for its unique functional properties.



## DRY PEA FLOUR ANALYSIS (Value Per 100 Grams)

NUTRIENTS	DRY PEA	% DAILY VALUE
Calories (kcal)	356.0	
Calories from Fat (kcal)	20.0	
Fat (g)	2.2	3
Saturated Fat (g)	0.0	
Trans Fatty Acid (g)	0.0	
Cholesterol (mg)	0.0	
Sodium (mg)	15.0	1
Carbohydrates (g)	65.0	22
Dietary Fiber (g)	25.5	102
Total Sugars (g)	8.0	
Protein (g)	23.5	47
Calcium (mg)	55.0	6
Iron (mg)	4.4	25
Potassium (mg)	981.0	28
Zinc (mg)	3.0	20
Vitamin A - IU (IU)	149.0	3
Vitamin C (mg)	1.8	3
Thiamin (mg)	0.7	48
Riboflavin (mg)	0.2	13
Niacin (mg)	2.9	14
Vitamin B-6 (mg)	0.2	9
"Folate, total (mcg)"	274.0	69

Compiled from the data provided by USDA database and ESHA Genesis SQL software

## FLOUR

Raw, pre-gelatinized flour, and flour made from peas that were heat processed before milling offer differences in flavor and functionalities.

- **Raw (split/whole)**

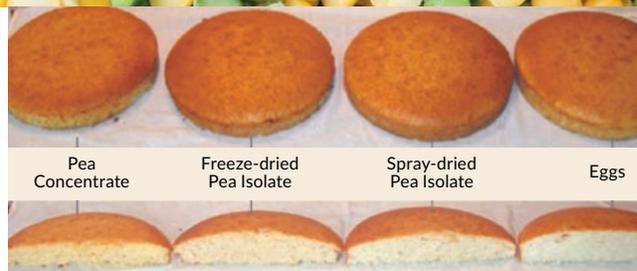
Anti-nutritive factors in pea flour such as polyphenols, phytic acid and trypsin inhibitors, along with color and flavor, can limit the use of raw pea flour as an ingredient. Raw pea flour is less common for applications that undergo less extensive heat treatment, such as bakery and meat products. Dry peas and other pulses can be treated to reduce the content of these anti-nutritive factors and to improve the flavor and nutritional value.

**TIP: Application determines the type of flour used. Know your application!**

- **Pre-gelatinized (split/whole)**

Treating raw pulse flour by heating partially gelatinizes the starches, inactivates enzymes, increases shelf-life, and improves flavor. These attributes make pre-gelatinized pulse flour suitable for some applications. Differences in size, form, and distribution of starch granules in the flours and to the internal arrangement of starch within the granules causes the gelatinization temperatures to be different among different types of pulses. Low protein and high amylose starches require high inputs of energy to undergo starch gelatinization. Low amylopectin starch has a higher gelatinization temperature, and is more resistant to enzyme and acid digestion compared to other starches. Pre-gelatinized pea flour serves as an effective flavor carrier, ideal for making more nutritious flatbreads, tortillas, pita breads, crackers, cookies, energy bars and extruded snacks. It also enhances dough yield, firmness and texture.

**Dry peas offer twice the protein of cereal grains, delivering 8 grams of high quality, low-fat, and all-vegetable protein per ¼ cup. Rich in lysine, dry peas and pea flour provide an amino acid profile that complements cereal grain proteins. Pea flour is also rich in slowly digestible starch and resistant starch, which contributes to its low glycemic index.**



White cakes prepared from pea concentrate, pea isolates and eggs. The bottom row represents the cross-section of the corresponding cakes.

Northern Pulse Growers Association

## PROTEIN

Pea protein (concentrate or isolate) has found its way into healthy, protein-fortified or gluten-free baked goods, snacks, cereals, pastas, energy bars and beverages. Pea protein is recognized as high quality protein with an amino acid balance that complements other common ingredients such as wheat, soy or rice protein.



## STARCH

Pea starch is a great alternative to chemically modified starch, due to its high amylose content. Gels can be prepared from pea starch with about 50 % less starch in comparison to corn starch. Pea starch can be used to modify the texture of frozen foods, extruded snacks, pasta, noodles, cookies, crackers, sauces and soups. A starch-based texturizing agent has been produced from high-amylose pulse starch. The aim of texturing agents is to create fat-like attributes like structure, viscosity, smoothness and opacity. This can reduce and/or replace the actual fat content in foods, including pourable salad dressings, yogurt, cottage cheese, sour cream, cream cheese, peanut butter, frosting, cheesecake, mousse and sauces.

## FIBER

Pea fiber fractions offer bakers a natural, more economical and nutritious alternative to gums. While enhancing dough yield, pea fiber fortification can also modify texture, create a full-bodied mouth feel, improve uniformity and consistency and reduce breakage in bars and cookies. Traditionally derived from the hull portion of the seed, pea fiber is 85% soluble and 15% insoluble fiber. Its high (20:1) water binding capacity, fat absorption and dough conditioning properties make pea fiber great for granola bars, pasta and many baked products.



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## MEET PULSES:

# The Next Big Superfood Category

## What are pulses?

In technical terms, they're the dry, edible seeds of plants in the legume family. In understandable terms, they're a category of superfoods that includes chickpeas, lentils, dry peas, and bean varieties. They're also incredibly healthy, affordable, sustainable and tasty.

### If pulses are so great, why haven't I heard of them?

Remember when you didn't know what quinoa or acai berries were, and now they're everywhere? While you may know pulses by their individual names – chickpeas, lentils, dried peas and beans – this year “pulses” will become a household term. That's because the United Nations declared 2016 as the International Year of Pulses, and will help raise awareness about them across the globe all year.

### How affordable are pulses?

Pulses are one of the most cost-effective proteins around. Compare the cost per serving for lentils at just 10 cents to quinoa's 59 cents or beef's \$1.49.

Cost per serving data sourced from ERS calculations, based on average prices from The Bureau of Labor Statistics and USDA Agricultural Marketing Service Data, as reported by the USDA, July 2015

### How good do they actually taste?

Pulses can be prepared countless ways and are delicious as well as nutritious, which is why many of the country's top chefs have begun including them in recipes from smoothies and ice cream to main dishes.

Cost per serving data sourced from ERS calculations, based on average prices from The Bureau of Labor Statistics and USDA Agricultural Marketing Service Data, as reported by the USDA, July 2015



DRY PEAS

BEANS

LENTILS

CHICKPEAS

### Why are they considered a superfood?

Pulses are nutritional powerhouses, loaded with protein, fiber, vitamins and minerals. They've also been shown to lower the risk of heart disease and diabetes, lower blood pressure and cholesterol, and help with weight loss. Gluten-free and vegetarian, they contain twice the protein of quinoa. Black beans contain 1.5 times the amount of iron as flank steak, and chickpeas have three times the folate (an essential B vitamin that helps prevent neural tube birth defects) as kale. Plus pulses are high in fiber—linked to weight loss and feeling fuller—and loaded with more antioxidants than blueberries or pomegranate juice. In fact, they're so nutrient-dense that nutritionists actually consider them both a protein and a vegetable at once.

Nutritional information sourced from the USDA Nutrient Database, antioxidant data as published in *Journal of Agricultural and Food Chemistry*, June 9, 2004; All nutritional figures based on ½ cup serving of cooked pulses

### Why does the U.N. care about pulses?

Because they're good for the environment and can feed the world. Pulses have a lower carbon footprint than almost any other food group, are water-efficient (using just one-tenth of the water of other proteins), and enrich the soil where they grow, reducing the need for chemical fertilizers that contribute to greenhouse gases. Pulses—grown in developing countries as well as here in North America—will play a major role in meeting future food needs, since the world's growing population is set to require a 70% increase in agricultural production by 2050.

Water footprint figures sourced from Arjen Y. Hoekstra and Ashok Chapagain, *Globalization of Water*, U. of Twente, Waterfootprint.org as reported by National Geographic, April 2010

Carbon footprint data sourced from: Nijdam, D. Rood, T., Westhoek, H. The price of protein. *Food Policy* 2012, vol 37, issue 6, pages 760-770



For more information:

Visit [www.pulses.org](http://www.pulses.org) now and [www.pulsepledge.com](http://www.pulsepledge.com) beginning January 1, 2016, or contact Josie Curtis, Maxwell PR | [josie@maxwellpr.com](mailto:josie@maxwellpr.com) / 503.231.3086



## MEET PULSES:

# *The* Health Powerhouses

Pulses, in technical terms, are the dry, edible seeds of plants in the legume family. In understandable terms, they're a category of superfoods that includes chickpeas, lentils, dry peas, and dry beans. They're incredibly healthy, which is one reason the United Nations declared 2016 as the International Year of Pulses.



*Here's how pulses pack such a nutritional punch that they're considered both a protein and a vegetable:*

- ✓ **Protein-packed:** They contain up to 9 grams of protein per ½ cup cooked serving—twice the protein of quinoa. And unlike many protein-rich foods, pulses are low in fat.
- ✓ **Beneficial for disease prevention:** Pulses have been shown to improve blood sugar control and reduce blood cholesterol and blood pressure, thus reducing the risk factors for heart disease and diabetes.
- ✓ **Good for dietary restrictions:** Being gluten-free and vegetarian makes them a good option for people with special diets, allergies or sensitivities.
- ✓ **Nutrients galore:** Pulses deliver high levels of potassium, magnesium, zinc, B vitamins and iron. One serving of black beans has 1.5 times the amount of iron as flank steak, plus three times the folate (an essential B vitamin) of kale, and as much potassium as a banana. Even more, red kidney beans are loaded with more antioxidants than blueberries or pomegranate juice.
- ✓ **High in fiber:** Pulses are high in both soluble and insoluble fiber, helping with staying regular, losing weight, and feeling fuller longer.
- ✓ **Smart source of folate:** Pulses are excellent sources of folate, a B vitamin important during pregnancy to reduce the risk for neural tube birth defects. Folate is also essential to brain development and function.



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MEET PULSES:

# The Sustainable Superfoods

In technical terms, pulses are the dry, edible seeds of plants in the legume family. In understandable terms, they're a category of superfoods that includes chickpeas, lentils, dry peas, and beans. They're also incredibly sustainable, why is part of why the United Nations declared 2016 as the International Year of Pulses.

*Here's why they're so earth-friendly:*

## Low carbon footprint

Greenhouse gas emissions from crop production are largely caused by nitrogen fertilizers. Pulses require less nitrogen fertilizers because they create their own fertilization by pulling nitrogen from the air and into the soil.



## Healthy soil

Pulses support a healthy and diverse farm system. They enrich soil health by leaving behind nutrients including nitrogen and beneficial microbes for the next crop.



## Water-savvy

Pulses use just one-tenth of the water of other proteins. For example, it takes only 43 gallons of water to produce 1 lb. of pulses compared to 800-1,800 gallons of water to produce the same amount of animal protein. Pulses extract water from a shallower depth, leaving more water deep in the soil for other crops, which makes them well-adapted for drought prone areas.



## Feeding the world

North America is the leading producer of pulse crops in the world. Since the world's growing population will require a 70% increase in agricultural production by 2050, pulses' low carbon footprint and water and soil efficiency make them the ideal sustainable food of the future.



For more information:

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## MEET PULSES:

# The World's Most Versatile Superfood

In technical terms, pulses are the dry, edible seeds of plants in the legume family. In understandable terms, they're a category of superfoods that includes chickpeas, lentils, dry peas, and beans. They're incredibly healthy, affordable, tasty and versatile – they can be used in everything from main courses to desserts.

*Here's why they're so adaptable:*



### Whole pulses stretch meals

In lasagna, tacos, casseroles, chili, or even meatballs, replacing half the meat with lentils will boost the fiber and nutrient content while reducing the cost, as well as sodium and fat. Or throw whole pulses, like chickpeas, into soups and salads to make them more filling and add plant-based protein and fiber.

### Pulses taste great

Whether prepared savory or sweet, pulses have long been a staple in Europe, the Mediterranean, India, Latin America, the Middle East and North America. Their great taste is why many of the country's top chefs are now including them in everything from salads to smoothies.



### Pulses know how to blend in

When pureed or turned into powders like chickpea flour or pea protein powder, pulses won't alter the flavor dramatically but will seriously boost the nutritional value, a boon for finicky eaters. Add pulses to dips or smoothies, or bake brownies and breads with a pulse flours, for a seamless, vegetarian, gluten-free way to get more protein and vitamins.

### Endless pulse possibilities

The many varieties of pulses make them excellent pantry staples for home and professional chefs alike. Add cooked pulses to pastas or salads to boost protein and fiber, or use pulse purees for dense and moist baked goods. Or look for packaged goods—from breakfast cereals to chips—that include the added nutrients of pulses and pulse flours.



For more information:

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## GLOBAL EXAMPLES OF COMMON PAIRINGS OF BEANS AND GRAINS

Rice is well-known as a staple crop across **Asia**, so it comes as no surprise that many traditional Asian recipes have variations of rice and beans. Traditional **African** cuisine makes great use of a wide variety of beans, chickpeas and grains. Beans, especially black beans, are served with rice in various combinations throughout **Latin America**.

### ITALY

*Pasta e fagioli* is a soup with pasta, beans, and vegetables.

### EGYPT

*Kochari* is a typical dish made from lentils and rice.

### NEPAL

*Kwati* is a traditional Nepalese dish which is a thick stew of kidney beans, black-eyed peas, chickpeas, soyabean, mung bean, green bean, black bean and white beans. *Kwati* is mainly eaten during Janai Purnima/Rakshya Bhandan at the end of August.

### CHINA

Rice sometimes is cooked into a thick porridge called congee, and often is paired with sugar and mung beans or red beans.



### BRAZIL

*Feijada*, a black bean stew served with rice, is a national dish of Brazil.

### COLOMBIA

*Calentado Paisa* is a traditional rice and bean dish.

### MEXICO AND VENEZUELA

*Tortillas* and their close cousin, *arepas*, found in Venezuela, are both corn-based flatbreads that often are filled with beans and vegetables.

### TURKEY

*Mercimek Köftesi* are vegetarian meatballs made from lentils, fine bulgur wheat and Baklali Enginar - a dish of peeled artichokes (fried with flour), dressed in oil and lemon juice and served in summer with beans and parsley.

### MOROCCO AND ALGERIA

*Garbanzo* beans are paired with whole wheat couscous and chicken for a delicious exotic stew.

### GHANA

A popular dish is *Waakye*, made by boiling rice and beans together.

### ETHIOPIA

Bean stews are served with *injera* bread, a pancake like bread made from the teff grain.

### ZAMBIA

*Nshima*, a staple food in Zambia is made from ground corn served with beans and vegetables.

### PAKISTAN

An important source of protein for the population, chickpeas, lentils, mung beans are used widely in spicy recipes with grains and chicken, from baby food to delicacies.

### INDIA

*Congee* often is prepared from other grains as well such as millet and served with a variety of cooked pulses. The people of Kerala also call this preparation of rice in a watery state *kanji*, and eat it as a porridge with green lentils or chutney.

### VIETNAM

Rice congee is sometimes cooked with Asian mung bean and is a food for times of famine and hardship.

For inspiring pulses-based recipes spanning several countries and continents, check out the recipes section on the official IYP site: [www.fao.org/pulses-2016/recipes/](http://www.fao.org/pulses-2016/recipes/)



Food and Agriculture Organization of the United Nations



# HEALTH BENEFITS OF PULSES

## TOP 10 REASONS TO EAT PULSES

- LOW-FAT
- LOW-SODIUM
- GOOD SOURCE OF IRON
- GOOD SOURCE OF PROTEIN
- EXCELLENT SUPPLIER OF FIBRE
- EXCELLENT SOURCE OF FOLATE
- GOOD SUPPLIER OF POTASSIUM
- LOW GLYCEMIC INDEX
- CHOLESTEROL-FREE
- GLUTEN-FREE

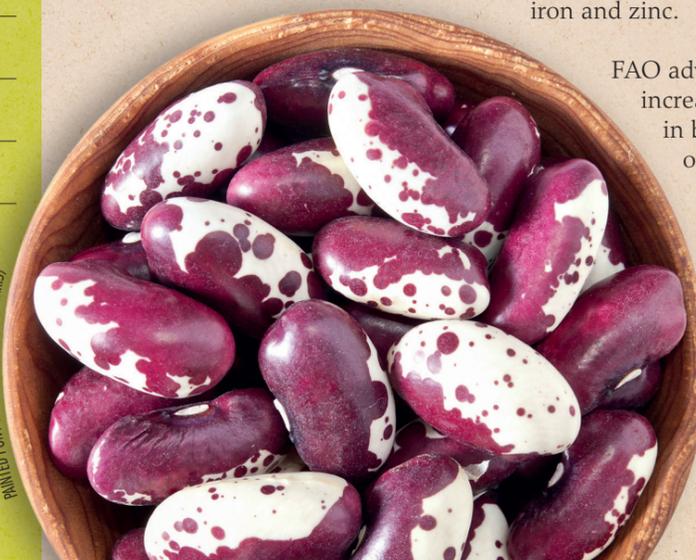
Diet is an important contributor to health, and to disease. Most countries face nutritional problems, from undernutrition and micronutrient deficiencies to obesity and diet-related diseases (such as type II diabetes and certain types of cancer), or a mix of these.

PULSES HAVE BEEN USED WIDELY IN CUISINE THROUGHOUT THE WORLD, PARTICULARLY IN **INDIA, PAKISTAN, THE MEDITERRANEAN REGION AND THE NEAR EAST**. NOT ONLY ARE PULSES **EASY TO PREPARE**, BUT THEY ALSO CAN SERVE AS A MEAT ALTERNATIVE.

Pulses such as lentils, dried beans, peas and chickpeas have been staple foods for many civilizations. Yet today, their nutritional benefits are often greatly underestimated. In some cultures pulses have a stigma of being a 'poor man's food' and are replaced by meat once people can afford meat.

The reasons why pulses are underestimated have been widely discussed: 1) the length of cooking time (much longer than vegetables); 2) some beans can cause flatulence because they contain oligosaccharides, a carbohydrate that is difficult to digest; 3) raw pulses contain high levels of 'anti nutrients' such as phytate, tannin and phenol, which can limit the body's absorption of minerals, such as iron and zinc.

FAO advocates for increased research in breeding strains of pulses that contain lower quantities of phytate so that iron and zinc can be better absorbed by the body.



PRINTED PONY BEAN (PHASEOLUS VULGARIS)



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fao.org/pulses-2016

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## SOAKING FOR ADDED HEALTH AND NUTRITION

Many pulses are soaked in water from 4 to 8 hours – a practice that will dramatically reduce their phytate content and cooking time and their propensity to cause flatulence. Soaking ensures that pulses can be more easily digested and their nutrients better

absorbed by the body. In fact, soaking dried pulses for several hours brings them back to life, activating their enzymes. Soaking in sodium bicarbonate solutions is more effective to reduce anti-nutrients than soaking in water alone.

### BOOSTING THE NUTRITIONAL VALUE OF THE VELVET BEAN

*Mucuna pruriens* (Leguminosae) is commonly known as velvet bean and includes approximately hundreds of varieties of annual and perennial legumes. Soaking mucuna seeds is an efficient process to reduce heat-stable antinutritional compounds such

as tannins, phytic acid, raffinose, stachyose and verbasco. Therefore, soaking increases the nutritional benefits of pulses. The treatment also vastly improves the protein digestibility of both white and black velvet bean seeds without affecting their nutritional quality. Additional autoclaving (a pressure chamber to sterilize products by steaming at a high pressure for a period of time), which can be done at industrial level for bean products has shown an additional reduction of other anti-nutrients (e.g. trypsin or

amylase inhibitors). The seeds of velvet bean, a South Indian underutilized pulse, have been reported to contain higher levels of protein and other nutrients than other crops. However, many Indians were reluctant to eat them because the bean had a high concentration of various anti-nutritional compounds. The promotion of soaking velvet beans in sodium bicarbonate solution to reduce anti-nutrients could lead to an increased consumption of these beans.<sup>1</sup>

## PULSES ARE PACKED WITH HEALTHY NUTRIENTS

Incredibly rich in their nutritional value, pulses are small but densely packed with proteins – double that found in wheat and three times that of rice. Unlike animal food sources of protein such as beef or milk, pulses do not contain residues of hormones or antibiotics used in animal production, but may contain residues of pesticides depending on the production method.

Pulses are also rich in complex carbohydrates, micronutrients, protein and B-vitamins, which are vital parts of a healthy diet. Low in fat and rich in fibre, pulses are excellent for managing cholesterol, digestive health and regulating energy levels. Pulses are also particularly rich in folate, iron, calcium, magnesium, zinc and potassium.

Fe

Ca

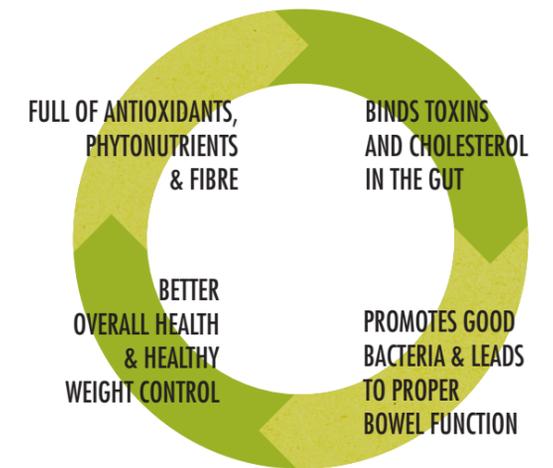
Mg

Zn

K

## A TONIC FOR THE BODY

While pulses are low in calories (260-360 kcal/100 g dried pulses), they are high in complex carbohydrates and fibre, which means they are slowly digested and give a feeling of satiety. Pulses promote a steady, slow-burning energy while their iron content helps transporting oxygen throughout the body, which boosts energy production and metabolism. The fibre in pulses are not generally absorbed by the body and thus increase stool volume and transit. The fibre also serves to bind toxins and cholesterol in the gut so these substances can be removed from the body. This improves heart health and lowers blood cholesterol.



## SPROUTING TO BREAKDOWN ANTI-NUTRIENTS

Sprouting is another term for germinating and results in a partially-grown young plant. It involves soaking and draining the pulses every 4 to 8 hours and this process usually takes 1 to 5 days. Sprouting pulses is vital to render them edible in a raw state and make them more easily digestible. Interestingly, sprouted pulses can significantly diminish polyphenols and tannins, and the protein, carbohydrates and fats begin to break down into a pre-digested form, leading to an easier and better digestion and making for better overall digestion.<sup>2</sup>

### SOURCES:

<sup>1</sup> V. Vadivel and M. Pugalenth. (2009). Effect of soaking in sodium bicarbonate solution followed by autoclaving on the nutritional and antinutritional properties of velvet bean seeds. *Journal of food processing and preservation* 33, 60-73.

<sup>2</sup> Khandelwal et al, 2010, Ghuman et al, 2016 and Shweta Khandelwal, Shobha A. Udipi, Padmini Ghugre. (2010). Polyphenols and tannins in Indian pulses: Effect of soaking, germination and pressure cooking. *Food Research International* 43 (2010) 526-530



### A PERFECT PAIRING: PULSES WITH GRAINS

The protein of pulses is high in lysine and low in sulfur-containing amino acids. Grains' protein is low in lysine but high in sulfur-containing amino acids. Combining them provides a higher protein quality. This means that the body needs less protein to fulfil its protein needs, which improves nutrition, especially in low-income communities, where the availability of other sources of protein such as animal protein are limited. The combination also contributes to a balanced diet.



# GLOBAL FLAVOR PROFILES- "A TASTE OF THE WORLD"

Excerpts from "All Around the World Cookbook"

By Sheila Lukins

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## CARIBBEAN PANTRY

Rice	Thyme	Curry	Sugar
Yams	Cilantro	Mint	Garlic
Limes	Capers	Avocados	Tomatoes
Pepper	Beans	Coconuts	Bananas
Allspice	Raisins	Soy sauce	Oregano
Scallions	Collard greens	Dried peas	Dried salt cod
Worcestershire sauce	Scotch bonnet chiles		

## SOUTH AMERICAN PANTRY

Argentina, Brazil, and Chile

Rice	Basil	Garlic	Scallions
Chiles	Beef	Papayas	Onions
Limes	Bananas	Coconuts	Peaches
Raisins	Oranges	Calabaza	Grapefruits
Tomatoes	Black beans	Chick peas	Black olives
Hearts of palm	Coconut milk	Collard greens	Suckling pig
Dried salt cod			

## MEXICAN PANTRY

Rice	Thyme	Almonds	Cumin
Cloves	Olives	Cilantro	Onions
Garlic	Vanilla	Oranges	Raisins
Oregano	Lemons	Tomatoes	Chayotes
Red onions	Dried beans	Cinnamon	

## GREEK PANTRY

Lamb	Thyme	Oregano	Figs
Mint	Garlic	Rosemary	Dill
Yogurt	Raisins	Almonds	Currants
Spinach	Lemons	Zucchini	Olive oil
Vanilla	Cinnamon	Coriander	Red onions
Hazelnuts	Pistachios	Cucumbers	White beans
Marjoram	Bell peppers		

## TUNISIAN PANTRY

Dates	Cloves	Basil	Garlic
Capers	Olives	Okra	Raisins
Harissa	Yams	Chiles	Pumpkins
Turnips	Tuna	Oranges	Tomatoes
Anchovies	Almonds	Pine nuts	Chickpeas
Bell peppers	Red onions	Olive oil	Bay leaves

## TURKISH PANTRY

Dill	Cloves	Mint	Saffron
Thyme	Sage	Anise	Honey
Capers	Basil	Garlic	Rosemary
Turmeric	Cumin	Nutmeg	Shallots
Cinnamon	Olives	Quinces	Eggplants
White beans	Cucumbers	Pastrami	Pumpkins
Pomegranates	Almonds	Pistachios	Walnuts
Cayenne pepper	Phyllo pastry	Bell pepper	Feta cheese

## MOROCCAN PANTRY

Mint	Cumin	Cloves	Dates
Raisins	Capers	Parsley	Garlic
Coriander	Prunes	Yams	Turnips
Tomatoes	Carrots	Onions	Tumeric
Pine nuts	squash	Lemons	Oranges
Cinnamon	Olive oil	Honey	Chickpeas
Hard-cooked eggs	Phyllo pastry		

## ITALIAN PANTRY

Oregano	Basil	Pears	Sage
Anchovies	Salamis	Capers	Sausages
Arugula	Fennel	Rosemary	Hazelnuts
Almonds	Polenta	Arborio rice	Cannelloni beans
Ricotta cheese	Dried red chiles	Prosciutto di Parma	Wild mushrooms
Flat-leaf parsley	Parmigiano-Reggiano	Extra virgin olive oil	

## SOUTHEAST ASIAN PANTRY

Mint	Mace	Coves	Turmeric
Cumin	Basil	Rice	Cilantro
Coriander	Shrimp	Ginger	Papayas
Bean sprouts	Bananas	Cabbages	Fish sauce
Mangoes	Mushrooms	Lemon grass	Mung bean
Soy sauce	Chili paste	Shrimp paste	Coconut milk
Brown sugar	Cardamom		

## INDONESIAN PANTRY

Ginger	Nutmeg	Cloves	Cumin
Coriander	Turmeric	Tamarind	Garlic
Cinnamon	Cilantro	Peanut Oil	Sugar

## CHINESE PANTRY

Pork	Cilantro	Shallots	Bean sprouts
Onions	Bok choy	Cabbages	Rice noodles
Vinegar	Sesame oil	Peanut oil	Chili oil
Chili paste	Plum sauce	Hoisin sauce	Rice wine
Sesame seeds	Red chiles	Wonton or spring roll wrappers	

## JAPANESE PANTRY

Garlic	Ginger	Sugar	Fluke
Daikon	Soy Sauce	Scallions	Scallops
Tofu (bean curd)	Rice wine vinegar	Salmon	Cucumber

# FLAVOR: ALL IN GOOD TASTE

Several key trends have combined to increase the consumer's awareness of and search for flavorful and healthy eating. It is the notion of *flavor* that sells, not only nutrition.

These can be summarized into three issues.

1. The continued popularity of ethnic foods and the introduction of ethnic ingredients and dishes into mainstream menus.
2. Global sourcing of ethnic foods gives chefs and consumers easy access to a wide range of fresh and flavorful ingredients. There is a new generation of chefs and cooks who are more aware of nutrition and innovative approaches for creating flavor. Creative measures to incorporate flavorful broths and concentrated vegetable juices in place of heavy cream- or butter-based sauces, a wider range of ethnic spices and ingredients (such as spice rubs, heirloom beans, and grains), and utilizing a variety of cooking techniques such as smoking, braising, roasting, marinating, and grilling. All of these serve to enhance the flavor of food.
3. The nutritional focus has changed from one that emphasized cutting back or taking away, such as for dietary fat, to one which emphasizes adding – more grains, beans, legumes, fruits, and vegetables. Close attention to the quality of ingredients and technique in preparation to preserve at best flavor, appearance, and nutrition value.

## FLAVOR

The following is a list of ideas which can be incorporated to enhance flavor and not add large amounts of dietary fat, sodium, or calories.

- Spice rubs and marinades
- Powders made from fruits, mushrooms, vegetables, garlic, olives, and citrus
- Pan reductions and glazes
- Roasted garlic and caramelized onions
- Preserved lemons
- Roasted bell peppers
- Chile peppers: dried or fresh
- Grilled vegetables
- Salsas and chutneys made from vegetables, fruits, and bean based
- Infused oils and vinegars
- Strong flavored oils used as finishing agents: sesame, extra virgin olive oil, walnut
- Sun-dried foods: tomatoes, cherries, cranberries
- Small amounts of full-flavored cheeses
- Wine

- Capers
- Ginger
- Seeds and nuts (can also be toasted to enhance flavor).
- Fruit and vegetable purées
- Heighten the flavor of grilled foods by a variety of wood chips: oak, grape vines, mesquite, apple, cherry, pecan or maple wood
- When steaming, toss herbs into the water
- Create aromatic broths by infusing stocks with a variety of herbs and spices. This liquid can be used to give beans and grains more flavor

Source: *Healthy Menus* © January 1997

## Glossary of Pulses

Appaloosa	A new pinto hybrid from the Palouse area of the Northwest. Two-toned lavender, tan, and white.
Adzuki	A small, oval, dark-red bean with a white ridge, grown and eaten in China and Japan for centuries. Great for Southwestern dishes or mixed with pasta for salads.
Anasazi	A red and palomino-colored bean. Named for the Anasazi cliff dwelling people of the dessert Southwest, these beans were found in the ruins by settlers in the early 1900s. A good all-purpose bean.
Baccicia	Mottled red and white medium-sized bean. Excellent for soups and Italian dishes.
Beluga lentils	Tiny fast-cooking black lentils which hold their shape quite well. These lentils are smaller than other lentil varieties and resemble caviar when cooked. Wonderful for lentil beds, garnishes, soups, and salads.
Black turtle	A small shiny jet-black bean. It is the basis for many Caribbean and Latin American soups and side dishes.
Black valentine	An heirloom black bean which is small and has an elongated round shape. An all-purpose bean that can be eaten fresh or dried.
Borlotti	Related to the cranberry bean. It is a medium-sized bean mottled with magenta. Used in Italian dishes.
Brown	A small oval brown bean also known as Swedish beans because of their popularity in Sweden.
Calypso	Has crisp black and white markings. Excellent for baking.
Cannellini	Large Italian white kidney bean which originally came from Argentina. It is excellent for minestrone and Mediterranean dishes. It has a smooth texture with a nutty flavor.
China yellow	Also known as sulfur beans due to their pale yellow color.
Chana dal	Split and polished baby garbanzo beans. <i>Dal</i> refers to split or cooked pulses. It is very sweet tasting, resembles sweet corn. Can be an interesting addition to soups, salads, and rice dishes.
Christmas lima	Large burgundy and white markings. Has a subtle taste of chestnuts and superb in casseroles and salads.
Cranberry	Mottled ivory-colored with cranberry red markings. It has a firm texture and is great for baking. New Englanders call them cranberry; Midwesterners, October; Southerners, shellouts; and Italians, borlotta rosecoco.
European soldier	Well-known in early New England. Long, white with a red “toy soldier” profile marking. Great for soups.

Fava	An ancient bean (dates back to pre-biblical Egyptian antiquity) which was called the broad bean or horse bean. Good in soups and salads. Must blanch 15-20 minutes to remove outer seed coat.
Flageolets	Originated in the Americas but cultivated and made popular in France and Italy. Pale mint-green color. Classic of French country dishes, particularly good with thyme and in lamb dishes.
French navy	Globular white with green tinge, smaller than marrow. Deliciously tender, excellent with seafood, soups, and salads.
Garbanzo	Also called chickpeas and ceci nuts. These are pale gold and round with a beet-like sprout. Used in African, Asian, Middle Eastern, and Italian dishes such as falafel, hummus, salads, pasta dishes, and soups.
Great northern	A medium-sized white bean grown commercially in Idaho, Colorado, Kansas, Wyoming, and Nebraska.
Jacob's cattle	Named this because they resemble the spotted and speckled cattle raised by Jacob in the bible. A sweet, fat, and fine grained bean.
Lima	Available in various sizes: Large limas known as butter beans, small limas are also available. The small limas are preferred for their buttery texture.
Mung	Small, round ancient bean commonly used for sprouting by Chinese and Indians. Also used dried, either whole or split.
Jackson wonder	Popular in Atlanta in the 1880s. Mottled shades of buff and purplish-brown. Great for soups.
Marrow	Plump white beans with a creamy texture. Larger than French navy. Popular in the United States in the 1850's as a baking bean. Slight bacon or smoky flavor. Purées nicely – great for soups.
Pink	Pale, pinkish red version of a kidney bean. Similar to a pinto bean.
Pinquito	An heirloom variety of a pink bean.
Painted pony	Brown and white markings, resembles appaloosas. Versatile for “chuck wagon style” cooking, soups, and side dishes.
Paris bistro soup	Top-quality mixture of 15 legumes with barley. Makes a great vegetarian soup.
Petite crimson lentils	About 1/3 the normal size of lentils of which we are accustomed to. Decorticated (outer seed cover removed) and cooks in four to six minutes. Not necessary to soak. Versatile for soups, salads, and garnishes. If cooked longer than twenty minutes becomes a golden-colored purée.

Petite French Green lentils	Previously imported from France and now grown domestically. Hold their shape when cooked, and make a delicious side dish or a bed for meats, fish, or game.
Rattlesnake	An attractive new pinto hybrid. Growing pods twist just like snakes. Speckled brown or tan. Superb for Southwestern chili.
Rice	Resemble plump grains of rice. Quick cooking, tender, and slightly sweet. Add to soups, casseroles, or vegetable dishes. Date back to 1860s in Germany.
Scarlet runner	An heirloom bean with deep violet and black markings. A large bean which can be picked young and eaten pod and all. It has a sweet taste and excellent tossed with new potatoes or with a salad.
Snow cap	A kidney bean with tomato flavor. It retains its markings when cooked. A snowy cap at one end with warm beige and brown markings. Great in creamy soups or chowders.
Spanish pardina	Also known as Spanish brown lentils or Continental lentils. This is the lentil that Italians, Greeks, and other Mediterraneans are accustomed to cooking with. These small lentils have a nutty flavor and hold their shape when cooked. Slightly larger than petite lentils.
Spanish tolosanas	Distinctive cinnamon and claret-brown color. Go nicely with clams or other seafood. Creamy texture.
Swedish brown	The real Swedish bruna conor (baked beans with bacon). Rich mocha color and great for baking.
Tongues of fire	Italians call these beans borlotto lingua di fuoco. A relative on cranberry beans. Mottled tan-colored with burgundy markings. Firm texture and great for baking. Popular in Italian and Portuguese cooking.
Tepari	A very old Mexican bean resembling a navy bean. Not common in this country yet, but it is gaining popularity and now grown in Arizona.
White emergo	Also known as sweet white runners. White and large, slightly irregular in shape. Creamy and sweet, can be used in soups and salads.
Yellow eye	Yellow beans with a dark spot or “eye” on a cream colored bean. Also known as molasses face. Date back to the 1860s in Maine and Vermont. In Boston, commonly used for baked beans because of their flavor. Preferred for hoppin’ John in parts of the South.

## SUGGESTED SOAKING AND COOKING TIMES FOR Legumes

Legumes	Long Method Hours	Short Method Hours	Cooking Time Hours
Adzuki beans	2 to 3	1	
Black beans	12	3	1-½ to 2
Black-eyed peas	12	2	1 to 1-½
Fava beans	12	4	1-½ to 2
Butter beans	12	4	1-½ to 2
Chick peas	12	3	1-½ to 2
Kidney beans red	12	2 to 3	1 to 1-½
Borlotti beans	12	2 to 3	1 to 1-½
Cannellini beans	12	2 to 3	1 to 1-½
Dutch brown beans	12	2 to 3	1-½ to 2
Egyptian brown beans (Ful medames)	12		
Fagioli beans	12	2 to 3	1 to 1-½
Field beans	12	2 to 3	1 to 1-½
Flageolets	12	2 to 3	1 to 1-½
Great Northern beans	12	2 to 3	1-½ to 2
Haricot beans	12	2 to 3	1-½ to 2
Lentils	No soaking needed		20 to 30 minutes
Mung beans	12	4 to 60 minutes	45 minutes
Navy beans	12	2 to 3	1 to 1-½
Pigeon peas	12	2	1
Pink beans	12	2 to 3	1 to 1-½
Pinto beans	12	2 to 3	1 to 1-½
Pearl beans	12	2 to 3	1 to 1-½
Split peas	No soaking needed		20 to 30 minutes
Soya beans	24	3 to 4	
White bean	12	2 to 3	1 to 1-½

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