LENTILS

Gems in the Treasure State

MONTANA
STATE UNIVERSITY

Lentils: Gems in the Treasure State

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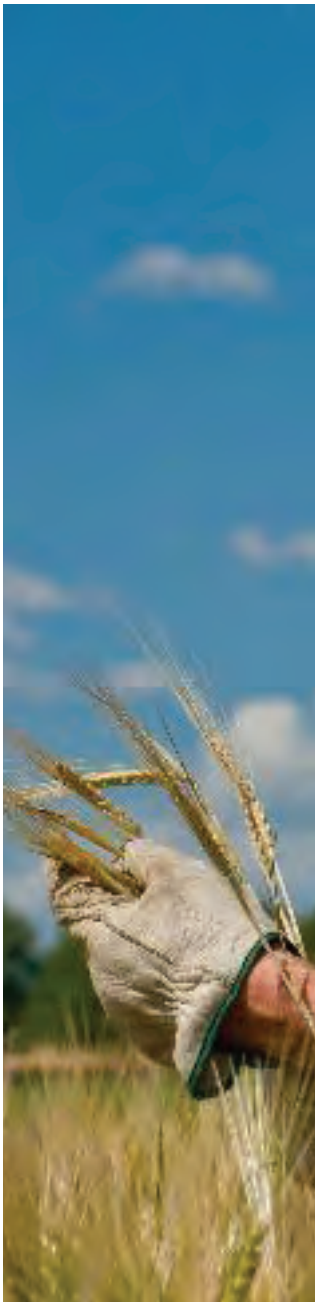
LENTILS: GEMS IN THE TREASURE STATE



Development of this lentil guide is part of a project funded by the USDA Specialty Crops Block Grant through the Montana Department of Agriculture. The purpose of the project is to contribute to the self-reliance of Montana's food system by promoting the production and consumption of organic lentils in Montana.

We seek to create new connections among growers and distributors, and end users of lentils including chefs, food service managers, dietitians, and eaters. Topics covered in this guide include production, processing and distribution, nutrition, and culinary uses.

The project was spearheaded by Dr. Alison Harmon, a member of the Montana State University Food and Nutrition faculty. Dr. Harmon enlisted the help of three graduate students studying Sustainable Food Systems: Marcy Gaston, Michael Fox, and Tim Reusch. Each student has made valuable contributions based on their own lentil expertise. We hope after learning more about lentils you will be inspired to grow more lentils, process and distribute more lentils, purchase more lentils, cook more lentils, serve more lentils, and eat more lentils!

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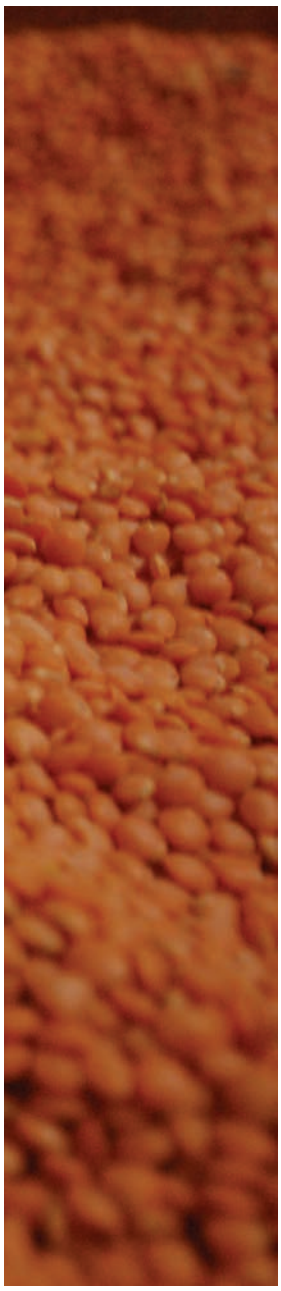

MONTANA'S FOOD SYSTEM

Montana is a large rural state, rich in natural resources like land, water, and clean air. Just over one million people live in Montana, topped by three million livestock. Two-thirds of our landscape is devoted to agriculture. ***A state like this should not have any trouble feeding itself, but we do.***

Many Montanans struggle with hunger. Montana's open landscape includes food deserts, where residents have to travel long distances to buy food from a supermarket. High quality food is not always available or affordable. Montanans have the same diet-related health problems as people in other states, including heart disease, diabetes, and cancer.

Many of Montana's counties are characterized by high poverty rates. This is due to the decline in rural jobs, including farming. Ironically, it is difficult to make a living growing food in a state with a three billion dollar agricultural industry. Our agricultural economy is vulnerable to federal policy changes. This dependence seems to contradict the rugged individualism that characterizes our people.

A century ago, Montana had a food processing industry, but now we export the majority of what we grow to be processed elsewhere. Then we buy

Young lentil plants growing in a field. ©Western Producer Media

foods back at a higher price to eat. Profits associated with adding value to food through processing are captured elsewhere. Overall, only about 10-15% of what we eat is produced in Montana, and each Montanan only spends an average of $6 per year buying foods directly from farmers.

Lentils: Montana's Real Treasure

Increasing the production and consumption of lentils can address multiple problems in Montana's food system. Lentils can help make Montana strong, proud, and independent again.

Lentils can strengthen our agricultural economy and natural resource base. Montana is a top producer of lentils, which are eaten all over the world. Growing lentils organically can improve our soil and increase producer incomes. We can process lentils in Montana, and they are nonperishable, so they are relatively easy to store and can be distributed without refrigeration.

Lentils are good food—satisfying, nutritious, and delicious. Because they are high in fiber, essential nutrients, and phytochemicals, eating lentils can improve our health and prevent chronic diseases like heart disease, diabetes, and cancer.

Cooking with lentils is simple and inexpensive, whether you are at home, in a restaurant, or preparing for a school, hospital or prison foodservice. Lentils are a high quality and versatile ingredient. Lentils can be ordinary dependable food for the every day dinner table, but they can also be a unique centerpiece for gourmet dishes.

Lentils are an example of how Montana can become more food self-reliant—how farmers can connect with eaters, home cooks, restaurant chefs, and institutional foodservices. By eating more lentils grown and processed in Montana, we can support farmers, support distributors, expand our culinary horizons, and learn to feed ourselves well for a reasonable price.

Montana Lentils by the Numbers

Montana produces 8 daily servings of lentils for each Montanan
or enough lentils for each American to double their annual consumption

103,499
tons of lentils produced in Montana per year

1 ton lentils = 2000 pounds

1 pound lentils = approx. 2 1/3 cups dry lentils

1 cup dry = approx. 3 cups cooked

1,015,165
population of Montana

1/2 cup = 1 serving of lentils

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EcoLibrary.org

PRODUCTION

Gems in a pod

Lentil Production

Lentils are produced all over the world, and the demand for lentils is also global in scope. Montana is an important producer of lentils, accounting for nearly half of lentils produced in the United States (See Table 1).

Table 1: Lentil Production in Montana and the United States

	2012		2013	
	Acreage	**Production[a]**	**Acreage**	**Production[a]**
Montana				
Conventional and Organic	205,000	107,249	115,000	103,499
Total U.S.				
Conventional and Organic	463,000	262,499	335,000	224,994

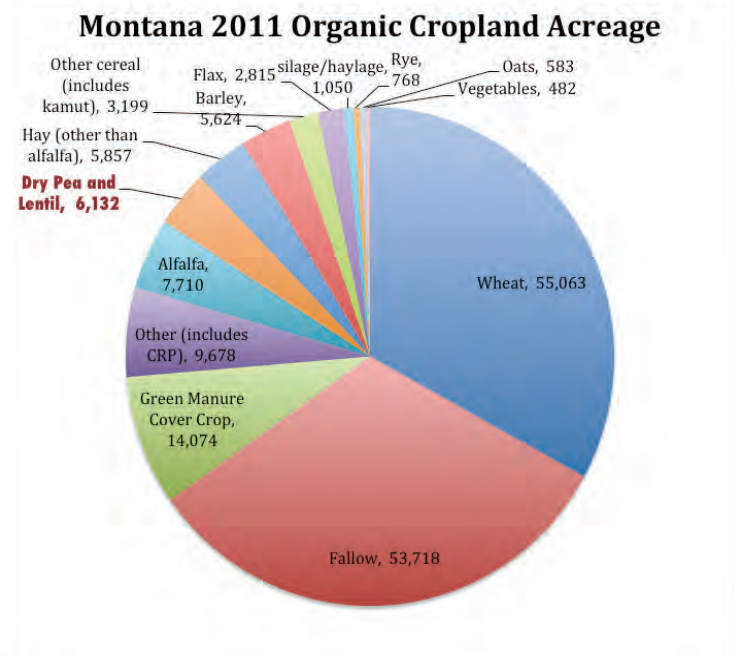
[a]Tons
Precise acreage is not available but is likely less than 5% of total crop production.
Source: USDA

Why Lentils?

Montana farmers overwhelmingly grow more wheat than any other field crop, and diversification relies on growing markets for rotational crops. In Montana, both conventional and organic farmers continue to rely on summer fallow, keeping farmland completely bare for an entire year for the purpose of controlling weeds and storing precious water in the soil. This practice has long been known to be detrimental to soil quality, and has declined in other parts of the northern Great Plains, but persists in parts of Montana. Lentils are

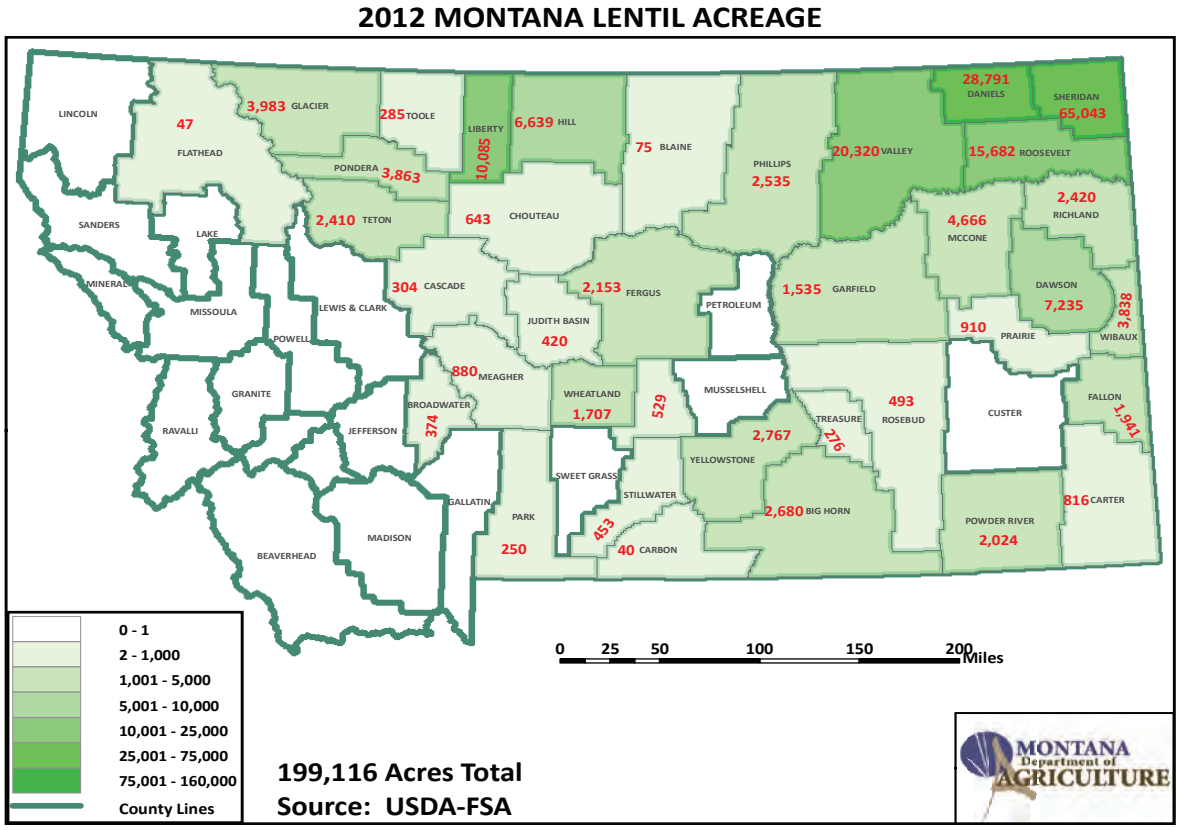
shallow-rooted, using soil water only to about half the depth that wheat does, making them an excellent candidate for rotation with wheat. Lentil plants are short in stature, therefore relatively poor competitors with weeds, and they are prone to disease, so they must be grown in rotation with other crops. As legumes (members of the pea family), lentils have a symbiotic relationship with soil bacteria, allowing them to fix atmospheric nitrogen; therefore lentils require no nitrogen fertilizer, and even contribute some nitrogen to subsequent crops. Dry peas and lentils grown for a grain rotation make up less than 4% of Montana's organic cropland acreage, while summer fallow is over 30% (Figure 1). Yet when they are used in a crop rotation, lentils can increase yields and provide income for producers. Diversifying crops, markets and risks decreases a producer's vulnerability.

Figure 1: Organic Cropland Acreage in Montana in 2011



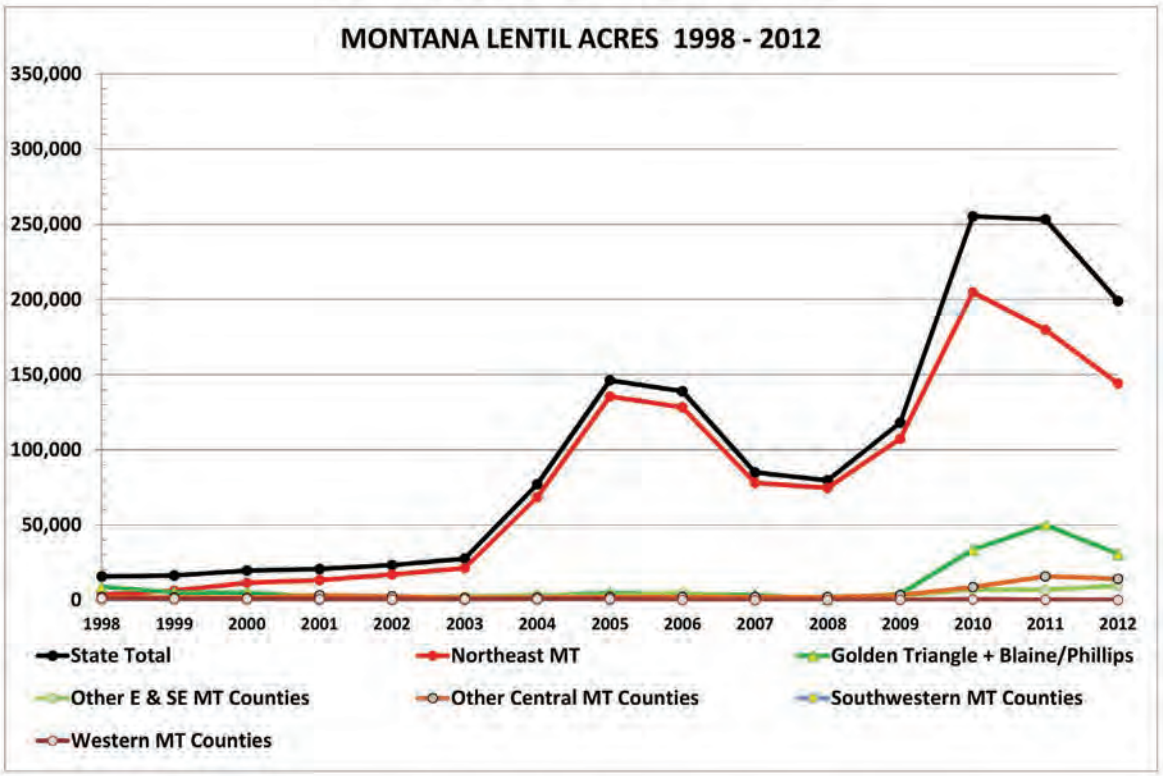
Lentils and dry peas are only a small part of the organic acreage in Montana occupying 6,132 acres
Source: Mac Burgess, PhD

Figure 2: Distribution of lentil acres in Montana in 2012



Acres of lentil (both organic and conventional) per county in Montana.
Source: USDA, MT Dept of Agriculture

Figure 3: Trend in Montana lentil acreage since 1998 (USDA-NASS)



Conventional and organic lentil acres have declined in recent years.
Source: USDA

Figures 2 and 3 further detail the production of lentils in Montana, displaying the actual acres of lentils grown in Montana in 2012 and the trend of lentil production since 1998.

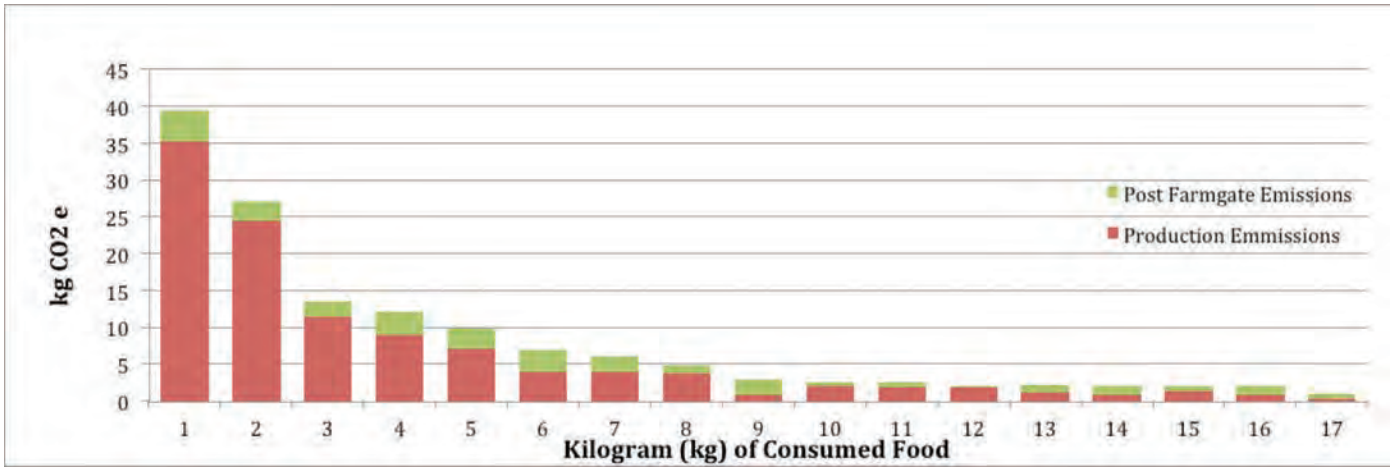
Why Organic Lentils?

Sustainability over the long term. Many changes observed in the environment are long term, occurring slowly over time. Organic agriculture considers the medium- and long-term effect of agricultural interventions on the agro-ecosystem. It aims to produce food while establishing an ecological balance to augment soil fertility or prevent pest problems. Organic agriculture takes a proactive approach as opposed to treating problems after they emerge.

Soil. Soil building practices such as crop rotations, inter-cropping, symbiotic associations, cover crops, organic fertilizers and minimum tillage are central to organic practices. These encourage soil fauna and flora, improving soil formation and structure and creating more stable systems. In turn, nutrient and energy cycling is increased and the soil's ability to retain nutrients and water are enhanced, compensating for the non-use of mineral fertilizers. Such management techniques also play an important role in controlling soil erosion. The length of time that the soil is exposed to erosive forces is decreased, soil biodiversity is increased, and nutrient losses are reduced, helping to maintain and enhance soil productivity.

Water. In many agriculture areas, pollution of groundwater courses with synthetic fertilizers and pesticides is a major problem. The use of these is prohibited in organic agriculture. They are replaced by organic fertilizers (e.g. compost, animal manure, green manure) and greater biodiversity (in terms of species cultivated and permanent vegetation). Both enhance soil structure and water infiltration. Well

Figure 4: Carbon Footprint of Common Foods



1: lamb; 2: beef; 3: cheese; 4: pork; 5: turkey; 6: chicken; 7: canned tuna; 8: eggs; 9: potatoes; 10: rice; 11: peanut butter; 12: nuts; 13: yogurt; 14: broccoli; 15: tofu; 16: dry beans; **17: lentils**
Source: Courtesy of Timeless Seeds, Inc.

managed organic systems, with better nutrient retentive abilities, greatly reduce the risk of groundwater pollution. In some areas where pollution is a real problem, conversion to organic agriculture is highly encouraged as a restorative measure.

Air and climate change. Organic agriculture can reduce non-renewable energy use by decreasing agrochemical needs (these require high quantities of fossil fuel to be produced). Organic agriculture contributes to mitigating the greenhouse effect and global warming through its ability to sequester carbon in the soil. Many management practices used by organic agriculture (e.g. minimum tillage, returning crop residues to the soil, the use of cover crops and rotations, and the greater integration of nitrogen-fixing legumes), increase the return of carbon to the soil, and this in turn raises productivity. The more organic carbon that is retained in the soil, the more agriculture can mitigate against climate change. Figure 4, provided by Timeless Seeds, Inc., shows the carbon footprint of a variety of foods. Livestock production emits the most carbon while lentils emit the least amount, giving them the smallest carbon footprint of food produced.

Biodiversity. Organic farmers are both custodians and users of biodiversity at all levels. At the gene level, traditional and adapted seeds and breeds are preferred for their greater resistance to diseases and their resilience to climatic stress. At the species level, diverse combinations of plants and animals optimize nutrient and energy cycling for agricultural production. At the ecosystem level, the maintenance of natural areas within and around organic fields along with the absence of chemical inputs create suitable habitats for wildlife. The frequent use of under-utilized species (often as rotation crops to build soil fertility) reduces erosion of agro-biodiversity, creating a healthier gene pool - the basis for future adaptation. The provision of structures providing food and shelter, and the lack of pesticide use, attract new or re-colonizing species to the organic area (both permanent and migratory), including birds and organisms beneficial to the organic system such as pollinators and pest predators.

Organic Standards:

Organic agriculture produces products using methods that preserve the environment and avoid most synthetic materials, such as pesticides and antibiotics. USDA organic standards describe how farmers grow crops and raise livestock and which materials they may use. Organic farmers, ranchers, and food processors follow these standards. Congress described general organic principles in the Organic Foods Production Act, and the USDA standards for organic production. These standards cover the product from

farm to table, including soil and water quality, pest control, livestock practices, and rules for food additives.

Organic farms and processors:

- Preserve natural resources and biodiversity
- Support animal health and welfare
- Provide access to the outdoors so that animals can exercise their natural behaviors
- Only use approved materials
- Do not use genetically modified ingredients
- Receive annual onsite inspections

Green Lentil Sprouts
Photo by Ibrahim Ahmed

The Lentil Underground in Montana

Contributed by Liz Carlisle, author of Lentil Underground: Renegade Farmers and the Future of Food in America

As famed paleobotanist Hans Helbaek once put it, "the history of lentils reaches back as far as the history of agriculture itself." According to archeological evidence, lentils have been rotated with staple grains since farmers began cultivating plants 10,000 years ago. Indeed, some scholars argue that these relatively drought-tolerant legumes were critical to the neolithic agricultural revolution. Long before chemical fertilizers were available, nitrogen-fixing lentils allowed farmers to replenish their soils — and add protein to their diets.

In Montana, however, lentils are a relatively recent addition to the state's two dominant cash crops, wheat and barley. In the late 1980s, a handful of organic farmers began experimenting with legumes as an alternative to synthetic fertilizer, which was both expensive and environmentally problematic. Under the auspices of the nonprofit Alternative Energy Resources Organization, these growers formed Farm Improvement Clubs to learn how to successfully raise and market lentils and other pulse crops. A farmer-owned small business named Timeless Seeds took on the challenge of processing and selling the novel harvest, and by the mid-1990s, it had established a respectable niche market for Montana-grown organic legumes. In terms of acreage, however, lentils remained a relatively minor crop for the Big Sky state: the 1992 Census of Agriculture found that just 876 acres of lentils and dry peas were harvested in Montana that year, compared to nearly 5 million acres of wheat. But if they started as an oddball crop for agrarian renegades, vegetarians, and environmentalists, it didn't take long for lentils to break into the mainstream. Harvested acreage of dry peas and lentils hit 15,000 in 1997, 26,000 in 2002, and a whopping 222,000 in 2007. According to the most recent agricultural census, Montana farmers now grow enough lentils to feed six servings a day to every one of the state's million residents.

Helbaek, H. 1963. Late Cypriote vegetable diet in Apliki. Act. Instit. Athen. Reg. Sueciae. Ser. 4, VIII: 171-186.
Zohary, Daniel. "The wild progenitor and the place of origin of the cultivated lentil: Lens culinaris." Economic botany 26.4 (1972): 326-332.
Census of Agriculture. National Agriculture Statistics Service.
Carlisle, Liz. 2015. The Lentil Underground. New York: Gotham Books.

Doug Crabtree & Anna Jones-Crabtree Vilicus Farm

Doug and Anna have been farming lentils since 2010, growing Black Beluga® lentils, golden flax, bronze hulless barley, and emmer on their farm Vilicus.

Vilicus is a Latin word meaning "Steward of the Land." They view being certified organic as only a beginning to making their entire farm and farming system sustainable.

"Anything that ends in the letters 'cide' doesn't belong as part of our farming system. Farming organically isn't just about not using pesticides and synthetic fertilizers; it's about limiting our need for a large operating loan each year. We couldn't afford the cost of those inputs." -Anna

Conservation has been an integral part of their farming system. Vilicus Farms is an incarnation of biodiversity. Their crops are not grown in the traditional 200 acre blocks, but in 240 foot ribbons, each separated by long conservation strips that are not plowed. The buffer strips act as hiding cover for animals, birds, and beneficial insects while serving to catch snow and reduce water and wind erosion.

They have worked with the National Resource Conservation Service (NRCS) to restore a saline seep, seed field borders to pollinator-friendly species, and employ cover crops. They focus on increasing soil health and productivity through a diverse 5-year crop rotation. They participated in a biodiesel project with Montana State Northern where the oilseed they grew was used for food grade oil in local restaurants, then processed into biodiesel for their equipment.

"Farming doesn't have to be about taking away from the earth. We believe it's about finding ways to grow nutritious food and give something back at the same time. Of course, it's always a work in progress." - Anna

Most recently they partnered with Xerces Society on a large scale native pollinator habitat restoration project. In 2013, lentils were one of the 21 different things they seeded.

Doug Crabtree and Anna Jones-Crabtree
Photo courtesy of Anna Jones-Crabtree

Vilicus Farms has also started a farmer apprentice program with the hope of enabling new entries into organic agriculture in the northern Great Plains.

"I believe farming is, without question, the most important 'job' anyone can do. It's my vocation." - Doug

Casey Bailey
Clearlake Organic Farm

Casey Bailey with his father, Robert
Photo courtesy of Casey Bailey

Located east of Fort Benton, Montana, Clearlake Organic Farm occupies 4000 acres, 1500 of which are organic. Casey is currently transitioning 200 acres each year to organic operations.

Having grown up on this farm, Casey ran a combine by the time he was a 11 years old. After a brief absence, he returned to his parent's farm in 2008. Armed with knowledge of soil science and gardening he started transitioning a 50 acre field to organic production on his own without much outside help.

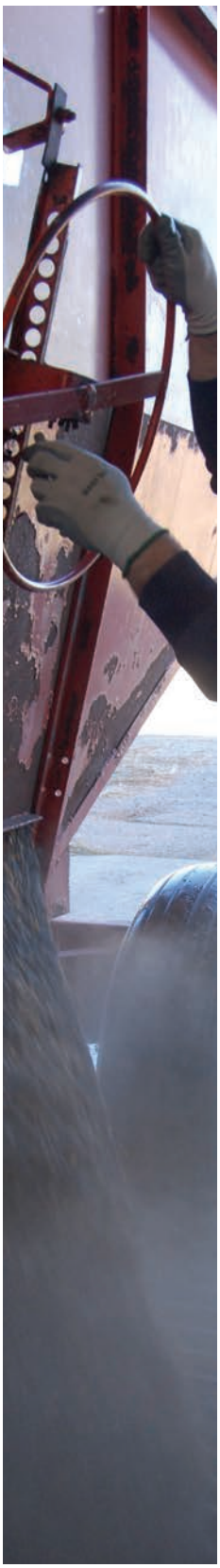
"I didn't know any organic farmers … I just jumped on the seeder and went for it."-Casey

"Lentils are both an amazing food for humans to eat and are good for the soil."- Casey

Despite the challenges of growing lentils, Casey feels lentils are an amazing food. He feels lentils are great for crop rotations and do well in the low moisture environment of central Montana, which only receives 14-16 inches of rain per year. This is due in part to their shallow root systems and ability to grow in semi-arid conditions and in poor soil conditions.

Growing organic lentils, according to Casey, is healthier for both the farmer and for the consumer. Even though he realizes that it is easier to grow lentils using conventional agricultural systems, organic lentils provide him with a product that he is happy to share with family, friends, and consumers.

"Organic lentils are nutritionally dense and chemical-free."- Casey



PROCESSING & DISTRIBUTION

Several companies process and/or distribute lentils in Montana. Columbia Grain International (CGI) has one facility in Plentywood, MT and another in Chinook, MT. American Pulses Limited has a facility located in Hingham, MT and Timeless Seeds is in Ulm, MT. The first three enterprises process conventional, i.e. not certified organic lentils in rail car and bulk truck quantities. Timeless Seeds grows, processes, and markets certified organic lentils in both retail and food service format. New facilities may be under development.

Processing Lentils

Growing to a height of 12-18 inches, lentils are not a competitive crop, meaning weeds and other volunteer crops are always present during the growing season. Additionally, the harvest equipment runs at ground level allowing for dirt to be taken up with the lentils. Since lentils are field harvested by the farmer, the "thresher run" product invariably includes a certain amount of dockage, volunteer cereal grain, and foreign material. These materials must be separated from the lentils before being offered for human consumption.

To ensure long-term storage stability, lentils are harvested at 12-15% moisture content. Once the lentils are at a processing facility, the crop is mechanically cleaned though a series of equipment that is capable of separating objects and lentils by size, shape, weight, and specific density. Destoners, magnets, and/or metal detectors are used for this process to remove objects like stones, dirt balls, and other foreign materials that may be of similar density and size to the lentils. A final separation is done by a high tech color sorter which rejects any remaining foreign objects or off color lentils that do not meet a selected color tolerance.

Petite Crimson™ and Harvest Gold™ are processed through a machine called a decorticator, whereby the seed coats are rubbed off to reveal the bright red-orange or bright yellow cotyledon.

As with other food-grade products, Montana processors of edible lentils are required to meet numerous compliance guidelines and inspections as established by Montana Department of Health and Human Services, Montana Weights and Measures, the United State Food and Drug Administration, and the Department of Homeland Security. Hazardous Analysis Critical Control Point (HACCP) plans are also a standard requirement for food processing facilities. Additionally, lentils labeled as Kosher or Certified Organic must also meet additional guidelines and be inspected by authorized, independent third party entities.

Processing Lentils at Timeless Seeds, Inc.

1. Taking lentils from the silo outside and filling the portable bin

2. Dumping product from the portable bin used to transfer yet-to-be cleaned product from storage bin to cleaning system receiving pit

3. Checking the stone strap from the destoner machine. The destoner removes stones and dirt balls.

4. Lentils in the gravity table to accept (left hand) and ones to reject (right hand). Gravity table separates the lentils by specific gravity.

5. Clean product from the Westrup air and screen machine. This machine separates by shape and aspirates off light fraction of chaff and weeds.

Distributing Lentils

Timeless Seeds, Inc.
Ulm, MT

Founded in 1987 by four young farmers, Timeless Seeds processes and distributes certified organic lentils and other legumes to not only Montana and other US states but to countries around the globe. With a dedication to sustainability, Timeless Seeds is the only Montana company that is a member of the Sustainable Food Trade Association and has signed the organization's Declaration of Sustainability and submits a sustainability report annually.

Timeless Seeds products can be found in numerous retail stores or through distributors in Montana, Idaho, Washington, California, and New England. In addition to the array of organic lentils, Timeless farmers also grow other organic crops such as Black Kabuli® chickpeas, heirloom grains, yellow split peas, and golden flax.

For more information about Timeless Seeds, visit: www.timelessfood.com

Timeless Seeds, Inc. Lentil Varieties
Harvest Gold™
Sunrise Red™
Black Beluga®
Petite Crimson™
Petite Pearl™
Green
French Green
Pardina

Mission Mountain Food Enterprise Center (MMFEC)
Ronan, MT

Mission Mountain Food Enterprise Center (MMFEC) is a fully functioning food processing, research and development facility in Ronan, MT. Started in 2000, it continues to provide a venue for nurturing specialty food entrepreneurs and value added agricultural producers. In addition to helping many Montana food businesses achieve success, MMFEC has also initiated a Farm to Institution and Farm to Table program. Working alongside Western Montana Growers Cooperative (WMGC), a regional marketing and producer cooperative, MMFEC has processed and distributed regionally sourced products to a variety of locations. The Montana Lentil Patty is of particular acclaim, composed of 90% Montana made products and distributed to the University of Montana and several restaurants. For more information, go to http://www.lakecountycdc.org/MMFEC%20Landing or call 406-676-5901.

MMFEC's Lentil Patty
Photo courtesy of MMFEC

Western Montana Growers Coop
Arlee, MT

Western Montana Growers Cooperative (WMGC) is a food distributing company located in Arlee that serves local individuals as well as retail stores, institutions, and restaurants. Started in 2003 and growing steadily since, WMGC is composed of over 35 farmers. WMGC provides food products grown in western Montana that are both seasonal and year round to Billings, Helena, Bozeman, Butte, Missoula and the Flathead Valley. They also distribute Timeless Seeds, Inc. legume and grain products.

For more information, contact Dave at 406-726-4769 or email: grower@wmgcoop.com.

Market Day Foods
Bozeman, MT

Market Day Foods is a self described 'online farmer's market' that is located in Bozeman. Distributing over 600 food products from more than 30 producers, Market Day Foods currently reaches eight communities in Southwest Montana. Available for the individual consumer, restaurants or food retail stores, Market Day Foods can deliver produce or it can be picked up by the customer. Timeless Seeds, Inc. lentils can be ordered in individual or in bulk portions. Varieties include Black Beluga®, Crimson Petite™, French, Green, Harvest Gold™, Pardina, Red Chief and Sunrise Red™.

For more information, contact Mariann at 406-522-S9501 or go to www.marketdayfoods.com.

Quality Food Distributing (QFD)
Bozeman, MT

Quality Foods Distributing (QFD) is a company located just outside of Bozeman distributing natural, organic and specialty goods to the Northern Rocky Mountain Region. Having started in 2010, their product line now includes over 900 items, with a distribution range of 400-500 miles, reaching up to Kalispell. Adapting to demand, QFD initiated a regular route to Great Falls and the Flathead Valley in January, 2014. Timeless Seeds provides the vast majority of the lentils that QFD distributes to a variety of establishments including grocery stores, foodservice operations, guest ranches and restaurants.

For more information, contact QFD at info@qfdistributing.com or call 406-552-2231.

QFD Distribution List for Timeless Seeds Lentils

Restaurants, Lodges, and Institutions	
Name	**City**
Big Sky Resort – Andiamo Restaurant	Big Sky
Buck's T-4 Lodge	Big Sky
Lone Mountain Ranch	Big Sky
Spanish Peaks Club	Big Sky
Field House	Billings
Lilac Restaurant	Billings
Walker's Grill	Billings
Community Foods Co-Op	Bozeman
Daily Coffee Bar	Bozeman
Gallatin River Lodge	Bozeman
John Bozeman's Bistro	Bozeman
Montana Ale Works	Bozeman
Open Range Food & Drink	Bozeman
Sola Café	Bozeman
Starky's Authentic Americana	Bozeman
Gravel Bar & Grill	Ennis
Benny's Bistro	Helena
Buttercup Market & Café	Missoula
Missoula Community Food Co-Op	Missoula
Silk Road Restaurant	Missoula
Café Regis	Red Lodge
Ruby Springs Lodge	Sheridan, MT
Teton Mountain Lodge	Teton Village, WY
YNP Lake Lodge	YNP, WY
YNP Mammoth Hot Springs Hotel	YNP, WY
YNP Old Faithful Inn	YNP, WY
Hillcrest Senior Living	Bozeman
Montana State University	Bozeman
Livingston Health Care	Livingston
St. Patrick's Hospital	Missoula
University of Montana	Missoula

Food retailers	
Name	**City**
Lee and Dad's Grocery	Belgrade
Good Earth Market	Billings
Lucky's Farmer's Market	Billings
Mary's Health Foods	Billings
Montana Harvest – Billings	Billings
Community Foods Co-Op	Bozeman
Heeb's East Main Grocery	Bozeman
Montana Harvest – Bozeman	Bozeman
Rosauers	Bozeman
Town & Country Foods – 11th	Bozeman
Town & Country Foods – 19th	Bozeman
Z's Meze Market	Bozeman
Hennessy Market	Butte
Mountain Front Market	Choteau
Sundrop Health Foods	Columbia Falls
Madison Foods	Ennis
Gardiner Market	Gardiner
Van's IGA – East	Great Falls
Van's IGA – North	Great Falls
Real Food Market and Deli	Helena
Van's Thriftway	Helena
Food Works	Livingston
Town & Country Foods Livingston	Livingston
Natural Grocers By Vitamin Cottage	Kalispell
Withey's Health Foods	Kalispell
Missoula Community Food Co-Op	Missoula
Mission Mountain Natural Foods	Polson
Babcock and Miles	Red Lodge
Beartooth Market	Red Lodge
East Rosebud Lake Store	Roscoe
Mountain High Health Foods	Cody, WY
Jackson Hole Grocer	Jackson, WY
Aspen's Market	Wilson, WY

NUTRITION

Small gems with big value

Lentils are a plant based powerhouse of nutrients. Regarded as both a vegetable and a protein by the USDA, lentils are a very low fat food, making it a lower calorie and healthful protein source.[1] Lentils also offer more than one third of the recommended intake of fiber in one ½ cup portion.[2] In addition, lentils contain important micronutrients such as folate, iron, potassium, and zinc. Folate is particularly important for women of childbearing age due to its role in the developing embryo. However, folate also is necessary for the production of red blood cells and protein metabolism.[3] A half cup serving of lentils provides 45% of recommended daily folate. Furthermore, one cup of lentils has potassium comparable to one banana. Potassium is imperative for electrolyte and fluid balance, as well as muscle and cardiac function.[4] Lentils are also gluten-free and can be used as a substitute for several of the top eight food allergens, including eggs, milk, nuts and wheat.[5] If that weren't enough, the nutrient profile of lentils includes an impressive amount of antioxidants and a low glycemic spike. This can be particularly beneficial to the increasing population of diabetics in their efforts to manage their glucose levels.[6] With 24% of adult Montanans obese, and 61% overweight in 2012,[7] 8% with diabetes in 2010[8] and the incidence of cancer in Montana close to the national average[9], lentils may just be the nutritional diamond in the rough that could solve many of these diet related chronic diseases.[10-12] Montanans are looking for a food that is tasty, satisfying and healthy. The nutrient profile of lentils lends itself as a perfect candidate, and with its delicious flavor lentils are worth adding to the menu.

The Lentil Powerhouse
A fat free food
High in fiber
Good source of potassium
Low glycemic index and load
Good source of protein
Rich in folate
Gluten Free
Excellent source of iron

With the typical American diet composed largely of processed foods that are high in fat, sodium and calories but low in nutrient density, it should come as no surprise that the USDA Dietary Guidelines 2010, the American Cancer Society, the American Heart Association (AHA), the American Diabetes Association (ADA), and the Academy of Nutrition and Dietetics all support an increase in the consumption of fruits and vegetables and dietary fiber, combined with a reduction in sodium,

processed meats and saturated fats.[1,6,13-15] The AHA specifically recommends eating nuts, legumes and seeds more than 4 times per week,[14] and the ADA encourages diabetics to consume foods that have a low glycemic spike that are high in fiber.[6,15] The consumption of lentils accords with many of these recommendations. The USDA has examined the nutrients that the average American is under-consuming and highlights these as 'nutrients of concern.'[1] Among these are dietary fiber, potassium, iron, and folate, all of which lentils provide in generous supply.[15]

Table 2: Assessment of Lentils and USDA Recommendations[1-2,47,80-81]

Nutrient/ Food Group	Unit	Dietary Guidelines Daily Rec. for 31-50 y.o.	Average intake/day	Lentil profile, 1/2 cup	Percent of Rec. Provided by 1/2 cup lentils
Vegetable	cup	2-3 cups/day	1 3/8 cup	1/2 cup = 1/2 cup	17-25%
Protein	oz. eq.	5-6/day	70-100g	1/4 cup = 1 ounce equivalent	33-40%
Sodium	mg	<2300	3600	2 per 1/2 cup serving	0%
Sat. Fats	mg	<10%	26	0	0%
Cholesterol	mg	<300	278	0	0%
Dietary fiber	g	25g (female, 19-50 y.o.) 38g (male 19-50 y.o.)	10-15	8	21-33%
Folate, DFE	µg	400	551	181	45%
Potassium	mg	4700	2800	369	8%
Vit. C	mg	75-90	89	1.5	2%
Calcium	mg	1000	1020	19	2%
Iron	mg	8-18	13-17	3.3	18-41%

Lentils are nutrient dense, contributing to several of the USDA nutrition recommendations that many Americans are failing to reach.

Fiber and Disease

Fiber is generally recognized as a plant based carbohydrate that our bodies cannot fully digest and absorb due to a lack of specific enzymes in our intestinal tract.[15] However, that is an incomplete perspective. Through a host of different pathways, research has shown fiber to be an integral part of a healthy diet. Studies have shown fiber combats a broad range of diseases including cardiovascular disease, type 2 diabetes, cancer and obesity.[12,16-21] It is therefore not surprising that the USDA recommends the average adult consume between 25-38 grams of fiber each day. With the average American consuming a mere 10-15 grams per day, the Dietary Guidelines for 2010 have recognized fiber as a nutrient of concern.[1] In Montana, there is a similar under-consumption, with fiber-rich vegetables being eaten less than two times per day.[22] Lentils are fiber rich, providing an impressive 21-32% of the recommended amounts for women and men in a single ½ cup portion, comprised of both soluble and insoluble fiber.[2,10]

Unlike the popular notion of the singular fiber aiding in digestion and regularity, there are two forms of fiber, soluble and insoluble, each with its own unique characteristics. Soluble fiber attracts water to the small intestine, adding bulk, slowing transit time, increasing the level of satiety and decreasing the glycemic spike.[15-23] Particularly beneficial to a person with type 2 diabetes, after a meal high in soluble fiber is eaten the blood sugar rises less and more gradually over a longer period of time.[24-27] In addition, soluble fiber is widely known to lower blood cholesterol and blood pressure, as well as increase satiety which can be a wonderful combination of factors for alleviating many common chronic diseases.[15,27] Soluble fiber is found in food items such as nuts, seeds, beans and most fruits. Insoluble fiber is comprised of the courser, stalky portions of vegetables and are mostly

Table 3: Benefits of Lentil Consumption[10-16,27,34,60]	
Conditions/Diseases	**Benefit**
Diabetes	Lowers glycemic spike Benefits comorbidities associated with diabetes: high cholesterol, high blood pressure, and obesity Increased insulin sensitivity
Obesity	Increased satiety Prolongs digestion Benefits conditions that are associated with obesity: type 2 diabetes, heart disease, high cholesterol, and triglyceride levels
Cancers: colorectal & breast	Prevention of onset
Heart Disease	Lowers cholesterol Lowers blood pressure Healthy alternative to meat which can be high in fat
Celiac Disease	Allows person to digest and absorb nutrients without harm to their intestinal tract Healthy alternative to foods including one or more of the top eight food allergens
Vegetarian/Vegan	Provides the amino acid, lysine Acts as a nutrient dense plant based protein
Fiber benefits several conditions and diseases in a variety of ways	

comprised of the cellulose in plants. Insoluble fiber also adds bulk to the stool but increases the speed of transit, which can therefore assist with constipation issues. Whereas the soluble fiber presents mostly in the small intestine, insoluble fiber acts in the large intestine. It is here that the insoluble fiber is broken down and digested through a process of microbial digestion called fermentation by the gut bacteria, known as gut flora or microbiota. As the fiber ferments, several components are released: hydrogen gas, carbon dioxide, hydrogen sulfide and some short chain fatty acids (SCFA).[28] Research into the relationship between diet, fiber intake and microbiota of the large intestine is producing exciting results. It appears that the microbiota have a role to play in health achievement and maintenance, including the improvement of insulin sensitivity and weight loss.[29-31]

Table 4: Fiber in Selected Foods[15]		
Food	**Serving Size**	**Total dietary fiber g/serving**
Lentils, cooked	1/2 cup	7.8
Kidney beans	1/2 cup	4.5
Raisin Bran	1/2 cup	3.75
Apple	1	3.7
Wheat bran flakes	1/2 cup	3.1
Prunes	5	3.0
Nuts, mixed, dry roasted	1 oz (~22 almonds)	2.6
Brussels Sprouts	1/2 cup	2.0
Oatmeal	1/2 cup	2.0
Broccoli, raw	1/2 cup	1.3
Peaches, canned	1/2 cup	1.3
Lentils are an excellent source of fiber even when compared to other foods that are commonly considered good sources of fiber.		

Protein comparison: How do lentils stand up?

Lentils are rich in proteins which constitute 22-30% of the seed,[32] depending on the variety. In addition, they are a fat free food, low in sodium and offer valuable nutrients like iron, potassium, folate, calcium and zinc.[7] As such, lentils are a great source of protein for vegetarians and omnivores alike. The discussion surrounding the quality difference of plant based proteins and animal based proteins has changed over the years.[34-36] Currently, it is accepted that a diet composed of diverse fruits and vegetables over the course of a day will provide the amino acids necessary for metabolic and physiologic function.[34-37] Lentils, for example, are low in the sulfur amino acids, methionine and cysteine, but high in lysine.[33,38] Other grain cereals tend to have the inverse, being high in methionine and low in lysine. The combination of lentils with an assortment of vegetables and grains would provide a complete protein profile, one in which all essential and non-essential amino acids are provided.[34]

As a result of these findings, the Academy of Nutrition and Dietetics has determined that a well balanced vegetarian or vegan diet is "healthful, nutritionally adequate, and may provide health benefits in the prevention of certain diseases." [34, pg.1266] Moreover, studies looking at people needing higher levels of protein found the same results. Two studies of vegetarian athletes showed that a vegetarian diet was adequate and did not affect performance.[36-37] Another study showed that a high protein lentil-based diet was comparably effective to an animal based protein diet in 2-5 year old patients recovering from Shigellosis.[39]

Table 5: Nutrient comparisons between lentils and various animal-based protein sources[46,47]

Nutrient	Unit	Lentils, Cooked	Cheddar Cheese, Red. fat (5 slices)	Chicken, breast meat only	Beef 80/20	Egg, hard-boiled	Fish, shrimp	%DRI[a] for 2000 kcal diet
Energy	kcal	**116**	309	144	271	155	99	2000
Carbohydrate	g	**20**	4	0	0	1	0	45-65%
Fiber, total	g	**8**	0	0	0	0	0	25-38
Protein	g	**9**	27	28	26	12.6	24	10-35%
Total fat	g	**<1**	20	3.6	18	10.6	.3	20-35%
Cholesterol	mg	**0**	76	86	91	373	189	<300
Saturated fat	g	**.05**	12.6	.9	6.8	3.3	.06	<10%
Iron	mg	**3.3**	.1	.5	2.5	1.2	.5	8-18
Potassium	mg	**369**	63	284	304	126	259	4700
Sodium	mg	**2**	628	328	75	124	111	<2300
Zinc	mg	**1.3**	4.4	.9	6.3	1.1	1.6	8-11
Thiamin	mg	**.17**	.02	.08	.05	.07	0	1.1-1.2
Folate, DFE	µg	**181**	20	8	10	44	0	400
Vit. K	µg	**1.7**	1.5	0	1.6	.3	0	90-120

Serving size: 100g
[a]Dietary Reference Intake (DRI) encompasses nutrition recommendations (RDA, AI, UL) of nutrients. Lentils offer an impressive nutritional profile when compared to animal based proteins, with low levels of cholesterol, saturated fat, and sodium, and beneficially high levels of iron, fiber, and folate.

Table 6: Nutrient comparisons between lentils and various plant-based food sources

Nutrient	Unit	Lentils, Cooked	Soy-bean, cooked	Peas, cooked	Black beans, cooked	Chick-peas, cooked	Peanuts, all types, raw	%DRI[a] for 2000 kcal diet
Energy	kcal	**116**	141	42	132	164	587	2000
Carbohydrate	g	**20**	11	7	24	27	16	45-65%
Fiber, total	g	**8**	4	4	9	8	9	25-38
Protein	g	**9**	12	3	15	9	26	10-35%
Total fat	g	**<1**	6.4	<1	<1	2.6	49.2	20-35%
Cholesterol	mg	**0**	0	0	0	0	0	<300
Saturated fat	g	**.05**	.74	.04	.14	.27	6.8	<10%
Iron	mg	**3.3**	2.5	2.0	2.1	2.9	4.6	8-18
Potassium	mg	**369**	539	240	355	291	705	4700
Sodium	mg	**2**	14	4	1	7	18	<2300
Zinc	mg	**1.3**	.9	.4	1.1	1.5	3.3	8-11
Thiamin	mg	**.17**	.26	.13	.24	.12	.64	1.1-1.2
Folate, DFE	µg	**181**	111	29	149	172	240	400
Vit. K	µg	**1.7**	n/a	25	n/a	4.0	0	90-120

Serving size: 100g
[a]Dietary Reference Intake (DRI) encompasses nutrition recommendations (RDA, AI, UL) of nutrients. The nutrient profile of lentils is strong when compared to other foods known to be good sources of plant-based proteins.

How easily these proteins can be digested and absorbed by the body (their bioavailability) is another point of difference. Lentils contain elements such as phytate and alpha-oligosaccharides that are primarily located in the shell that protects the seed in the wild environment.[35] These elements are known to reduce the availability of micronutrients and the digestibility of proteins, and are thus referred to as anti-nutrients.[32,35,40] However, easy methods of food preparation can reduce or completely eliminate these complicating factors. Soaking the seeds prior to cooking, germinating, sprouting as well as fermenting have all shown to reduce the anti-nutrients and, more importantly, increase the availability of minerals and the digestibility of proteins.[32,40-45]

Table 7: Antioxidant Capacity of Different Foods[53]

Food Items (100g)	ORAC value[a]
Oregano, dried	175,295
Oregan, fresh	13,970
Lentils, raw	7,282
Basil, fresh	4,805
Blueberries, raw	4,669
Apple, fuji, with skin	2,589
Bread, multi-grain	1, 421
Banana, raw	795
Tomatoes, plum, raw	546
Peaches, canned	436

[a]ORAC value (µ mol TE/100g)
Lentils are high in antioxidant capacity relative to other foods like blueberries that are commonly regarded as being a good source of antioxidants.

Antioxidants

As part of normal digestion and metabolism, the chemical reactions that occur both require and produce oxygen. The oxygen that we require to live can also harm us. As a very reactive chemical, it has been grouped with other damaging reactive molecules and referred to as a 'free radical.'[48] The imposed damage is known as oxidative stress which has shown to play a role in dozens of disease states, including

cardiovascular disease, diabetes, cancer, and obesity.[48-52] Antioxidants, found mostly in whole foods, offer a way to reduce this oxidative stress. Blueberries have become popular providers of antioxidant properties, but lentils contain 56% more antioxidant capacity than blueberries.[53]

National School Lunch Program

When it comes to feeding children during the day at school, lentils provide school cafeterias a range of options, especially since they are inexpensive, less likely to be allergenic, and meet or exceed the nutrition standards set forth by the USDA in the National School Lunch Program. School lunches must provide about 1/3 of a student's nutrient needs for a day which include a variety of fruit, vegetables, grains, and meat. For grade school children, this means their daily school lunch should include a 1/2 cup of fruit, 3/4 cup of vegetables including legumes, one cup of grains, 1 cup of milk, and one ounce of meat. Schools have the option of including more vegetables in the lunches, increasing the vegetable intake at lunch to 1 3/4 cup for each child. While many vegetables can be expensive, lentils are a great economic value, are easy to prepare, and can be included in a variety of recipes. Lentils are also a viable gluten free and allergen free option for many cafeterias. Tables 8 and 9 compare the prices of lentils versus conventional and organic animal protein sources. Lentils are considered a vegetable but with high amounts of protein, they also can serve as a meat substitute.

Table 8: Price Comparison of Conventionally Produced Proteins for 100 grams[56,57]

Protein Source	Price per 100g	Protein in 100g	Price per gram
Lentils	$0.12	9g	$0.01
Egg, approx. 2 eggs	$0.38	25g	$0.02
Chicken, breast	$0.83	28g	$0.03
Cheese, cheddar	$1.06	27g	$0.04
Beef, lean & extra lean	$1.18	26g	$0.05
Shrimp	$1.42	24g	$0.06

Conventionally produced lentils are the most cost effective protein source when compared to conventionally produced animal-based proteins.

Table 9: Price Comparison[a] of Organically Produced Proteins for 100 grams

Protein Source	Price per 100g	Protein in 100g	Price per gram
Lentils	$0.39	9g	$0.04
Egg, approx. 2 eggs	$0.71	25g	$0.03
Beef, lean & extra lean	$1.58	26g	$0.06
Chicken, breast	$1.73	28g	$0.06
Cheese, cheddar	$1.97	27g	$0.07
Shrimp[57]	$4.04	24g	$0.17

[a]Current (2014) retail prices in Bozeman, Montana. Organic lentils are among the most cost effective protein source when compared to organically produced animal-based proteins.

Allergens

There are an estimated 15 million people in the United States who have food allergies.[58] The Centers for Disease Control and Prevention (CDC) released a study in 2013 stating that food allergies in children had increased 50 percent between 1997 and 2011[59]. The FDA reports that the foods listed in the attached table account for 90% of all allergic reactions[60]. The food industry is all too aware of the effects that these food allergies have had on the food supply, and consumer demand for food alternatives has become big business. By contrast, lentils rarely cause allergic reactions. They can be used as a substitute for the allergens listed, including wheat and nuts.

Table 10: Most Common Allergenic Foods[a] [60]

Rank	Food
1	Milk
2	Eggs
3	Fish (i.e., bass, flounder, cod)
4	Crustacean fish (i.e., crab, lobster, shrimp)
5	Tree nuts (i.e., almonds, walnuts, pecans)
6	Peanuts
7	Wheat
8	Soybeans

[a]According to the FDA, the top eight food allergens account for 90% of all food related allergic reactions

Bioavailability

Lentils are high in many micro and macronutrients (table 11).[33] Like all legumes, lentils contain compounds mostly found within the shell that prevent or reduce digestion and absorption of the nutritional compounds and are thus referred to as anti-nutrients. Prominent anti-nutrients in lentils are oligosaccharides, trypsin inhibitors and phytates.[42-44,61] Oligosaccharides not only bind to minerals but are also known to be the main cause of flatulence.[42,62] Trypsin inhibitors block the function of enzymes designed to break down proteins while phytic acid binds to micronutrients such as calcium, iron and zinc, thus reducing or preventing their absorption.[32,40,44,61-64] These anti-nutrients have the purpose of protecting the seed during the dry and cold climates in which these legumes grow.[35] Surprisingly, there are simple measures available that can greatly reduce or eliminate the anti-nutrients, like soaking and germinating. Soaking lentils before cooking, as is the procedure with other legumes, has been shown to reduce anti-nutrients almost completely.[41,45,65-66] Cooking will further breakdown anti-nutrients[66]. Additionally, germinating, sprouting and fermenting has been shown to not only break down anti-nutrients by 100%,[41,65] they can improve the amino acid profile, making it a protein of higher biologic value.[67-69] Likewise these simple processes will also increase the amount of vitamins and minerals that our bodies can absorb. By reducing the anti-nutrient levels, the amounts of minerals like iron, zinc and calcium and many of the B vitamins that can be absorbed increases dramatically. While this section focuses on the benefits of breaking down those anti-nutrients, they do have impressive benefits in their own right so we should keep the 'anti' in perspective. Anti-nutrients are also known to be a good source of fiber, antioxidants, and have DNA protective effects as well as anticancer properties.[50,70] So no matter how you decide to prepare and cook them, lentils offer valuable nutrition, period.

Table 11: Lentil's Nutrients[2,47]

Nutrient	Unit	1/2 cup, 100g green lentils, cooked	%DRI based on 2000 kcal
Energy	kcal	116	2000
Carbohydrate	g	20	6-11%
Fiber, total	g	8	21-32%
Protein	g	9	18%
Total fat	g	<1	0%
Cholesterol	mg	0	0% (goal: <300mg)
Saturated fat	g	.05	0% (goal: <10%)
Iron	mg	3.3	18-41%
Potassium	mg	369	8%
Zinc	mg	1.3	12-16%
Manganese	mg	.5	22-28%
Phosphorus	mg	180	26%
Sodium	mg	2	0% (goal: <2300mg)
Thiamin	mg	.17	14-15%
Folate, DFE	µg	181	45%
Vitamin K	µg	1.7	1%

Simple preparation techinques like soaking prior to cooking lentils can increase how easily we can access and absorb nutrients like iron and zinc as well as the individual amino acids in protein.

Flatulence. Strategies for Reduction

While it is popular to blame legumes, there are other causes for flatulence. Trapping air between our food by drinking through a straw or eating quickly, eating sugar free products containing sorbitol, drinking carbonated beverages like soda and beer, and lactose intolerance are known to be some of the worst offenders.[71-73] The other form of gas production occurs in the large intestine. When food passes through the small intestine undigested and unabsorbed, it continues to the large intestine where it undergoes microbial digestion, or fermentation. As a natural byproduct of this reaction gases are produced that cause flatus.[28,62,71]

Ways To Reduce Flatulence[71-73]
Soak in advance to consumption – even if cooking
Sprout the bean, legume or pulse
Introduce fiber intake slowly
Eat slower
Chew more thoroughly
Limit drinking beverages through straws
Reduce carbonated beverages
Take Bean-O® before a meal

Lentils have components that humans cannot digest within their small intestine and thus they proceed to digestion in the colon. The alpha-oligosaccharides have been identified as the primary culprit[42,43,70,74]. Fortunately, simple steps have been identified to reduce, and in some cases completely eliminate, these starches. Soaking the lentils for 6-12 hours prior to cooking has been shown to drastically reduce these oligosaccharides.[41,61,66,75] Vinegar can also be used in soak water or incorporated into a recipe. Germinating,[65,76-77] sprouting, as well as fermenting[64,78] have also shown impressive reductions of up to 100%.[65,77] In each case, water activates the enzyme intrinsically located within the lentil to break down the oligosaccharides that we are unable to breakdown in our normal digestive process.

That said, it is unlikely that flatulence will disappear completely, nor should it. Many of the components that create fermentation within the large intestine confer a host of other benefits to our health, such as promoting a healthy gut flora. This has been shown to influence our state of health in several conditions, including chronic diseases like diabetes.[29-30,70] As the "Ways to Reduce Flatulence" table indicates, there are other strategies to lessen gas production such as chewing more slowly and more thoroughly, and introducing fibrous foods slowly into the diet thus providing the gut flora time to adjust.

Sprouting Lentils

Sprouting seeds can be easily achieved[76] and is worth the minimal effort involved. Sprouting breaks down the fibrous components within the raw seed that are bound to vitamins, minerals and amino acids that we require.[44,65,67,68,76] By releasing this bond, sprouting increases the availability of these micronutrients such as iron and zinc.[66,68,79] Amino acids are also made more available and thus increase the digestibility of proteins.[67-69,77,79] Studies have even shown the amino acid profile of the sprouted lentil seed to be of higher biologic value than non-sprouted lentils.[67-69] In other words, it has more amino acids present after sprouting than before. Further, this process practically eliminates all occurrence of flatulence.[65,76] A pretty good deal.

Benefits of Sprouts
Aids in digestion
Increases Enzymatic Activity
Reduces Flatulence
Increases Bioavailability of Vitamins, Minerals and Amino Acids

Sprouted Black Beluga® lentils before (dry) and after (sprouted).

Sprouted Lentils

(can be added to bread recipes or used in salads)

1/2 cup lentils (Black Beluga®, French Green, Pardina, or Green), rinsed
Mason jar with ring
Cheesecloth
Water

Place the lentils in a jar. Add enough water to cover the lentils by 2-3 inches. Place a piece of cheesecloth on the top before screwing on the ring. Place on the counter in the kitchen out of direct sunlight. Leave for 12-15 hours.

Drain the water off the lentils. Leave the lentils on the counter out of direct sunlight (with mouth of jar tilted downward for drainage) for 1-3 days, depending on how long you want the sprout to be. During this process, rinse and drain the lentils with fresh water, every 12 hours.

Spread onto a towel. Allow to dry for 2 hours. Store in an airtight container in the refrigerator, for up to 1 week.

Safety Note: If bacterial growth is a concern, lentils can be presoaked in a weak bleach solution (1 teaspoon per gallon) for 30 minutes.

CULINARY USES

Gems in the kitchen

Lentils, like many legumes, are versatile ingredients in the kitchen.
High in fiber and protein, lentils can be used in main dishes, appetizers, and in baked goods. They can be cooked, pureed, soaked, sprouted, and ground into flour. Incorporating lentils into everyday cooking is a good way to add more nutrients to many dishes. Even though simply cooking lentils by themselves is the easiest way to prepare, serve, and eat them, there are many other easy ways to begin using lentils in the kitchen:

15 Easy Ways to Use Lentils

1. Add 1-2 tablespoons cooked lentils to smoothies for added protein and fiber.
2. Add lentil flour to baked goods. Substitute 1/4 cup of dry lentil flour for 1/4 cup of wheat flour.
3. Add lentil puree to baked goods as a butter substitute. Take out 1/2 of the butter and use green lentil puree instead.
4. Add lentil puree to baked. goods using whole wheat flour for added moisture. Add 1/2 cup lentil puree to a cake or cookie recipe using whole wheat flour by making small adjustments to the whole wheat flour content of the recipe (see page 28 for more information).
5. Add cooked or sprouted lentils to salads.
6. Add lentils to vegetarian soups for additional protein.
7. Add lentils to stews.
8. Use as a substitute for barley.
9. Add cooked lentils to mashed potatoes.
10. Serve lentils on their own as a side dish.
11. Make rice and lentil pilaf.
12. Instead of Pasta Salad, make Lentil Salad.
13. Use lentils in place of beans in chili.
14. Use lentils as a meat substitute in meatloaf and burgers.
15. Add pureed lentils to turkey meatballs.

Common Lentil Varieties

Lentils come in many shapes, sizes and colors. Commonly found varieties of lentils include green, red, golden, brown, black, and French green. Each variety has unique characteristics that separate it from the others. Each even has slightly different nutrient values, as illustrated in Table 12. For instance, Black Beluga® lentils are the only ones tested to have a measureable value for Vitamin A. Each lentil variety varies slightly in carbohydrate, fat, protein, sodium, calcium, iron, and Vitamin C content. Additionally, all the lentils are cholesterol free.

Lentils also differ in how they cook, as indicated in Table 13. For instance, the outer skin is removed from Petite Crimson™ and Harvest Gold™ during processing causing them to have a mushier texture when cooked compared to the other lentils. Utilizing the proper lentil for the recipe is key to culinary success. Each lentil variety from Timeless Seeds is listed on the next couple of pages, along with general characteristics of each.

Table 12: Nutrient Analysis of Timeless Seeds, Inc Lentils

Analyte	Unit	Green	French Green	Black Beluga®	Harvest Gold™	Pardina	Petite Crimson™
Energy	kcal	353	366	362	360	358	368
Carbohyrdates	g	64	62	63	62	65	61
Protein	g	22	26	24	23	22	27
Fiber	g	28	25	30	18	28	20
Total Fat	g	0.9	1.8	1.6	2.1	0.9	2.2
Sat. Fat	g	0.2	0.3	0.3	0.3	0.2	0.4
Cholesterol	mg	0	0	0	0	0	0
Sodium	mg	8.7	8.2	8.9	7.3	8.0	7.1
Calcium	mg	53.8	34.0	39.0	15.6	42.4	6.4
Iron	mg	10.0	8.7	7.9	9.6	6.0	6.1
Vit. A	IU	0	0	74	0	0	0
Vit. C	mg	5.9	1.5	9.4	0	0	3.8

Serving size: 100 g dry lentil seed
Each lentil variety was analyzed separately for nutritional analysis. Results show slight variations between the lentils in macronutrients (carbohydrates, fat, and protein) and micronutrients (sodium, iron, and vitamin C). Black Beluga® is the only lentil tested to have a concentration of vitamin A over 50 IU.
Source: RL Food Testing Laboratory conducted original nutrient analysis for this project.

Timeless Seeds, Inc. Lentil Varieties

The following lentils are sold via Timeless Seeds, Inc (profiled on page 12). The company offers six different varietals, which have been used in the recipes in this booklet. Each varietal has been cooked separately to determine the differences in texture and volume between each one.

Green:
Characteristics

- **Dry**: large, greenish-brown color
- **Cooked**: holds its shape, color dulls to grayish green
- **Great for**: nearly anything calling for lentils (most versatile) - purees to use in baked goods, as a meat substitute, soups, stews, sprouted
- **Flavor**: earthy

Red (Petite Crimson™, Sunrise Red™)
Characteristics

- **Dry**: small, flat, light red in color
- **Cooked**: mushy, color changes to yellowish-orange
- **Great for**: purees to use in baked goods or smoothies, lentil stews, adding to mashed potatoes
- **Flavor**: mild

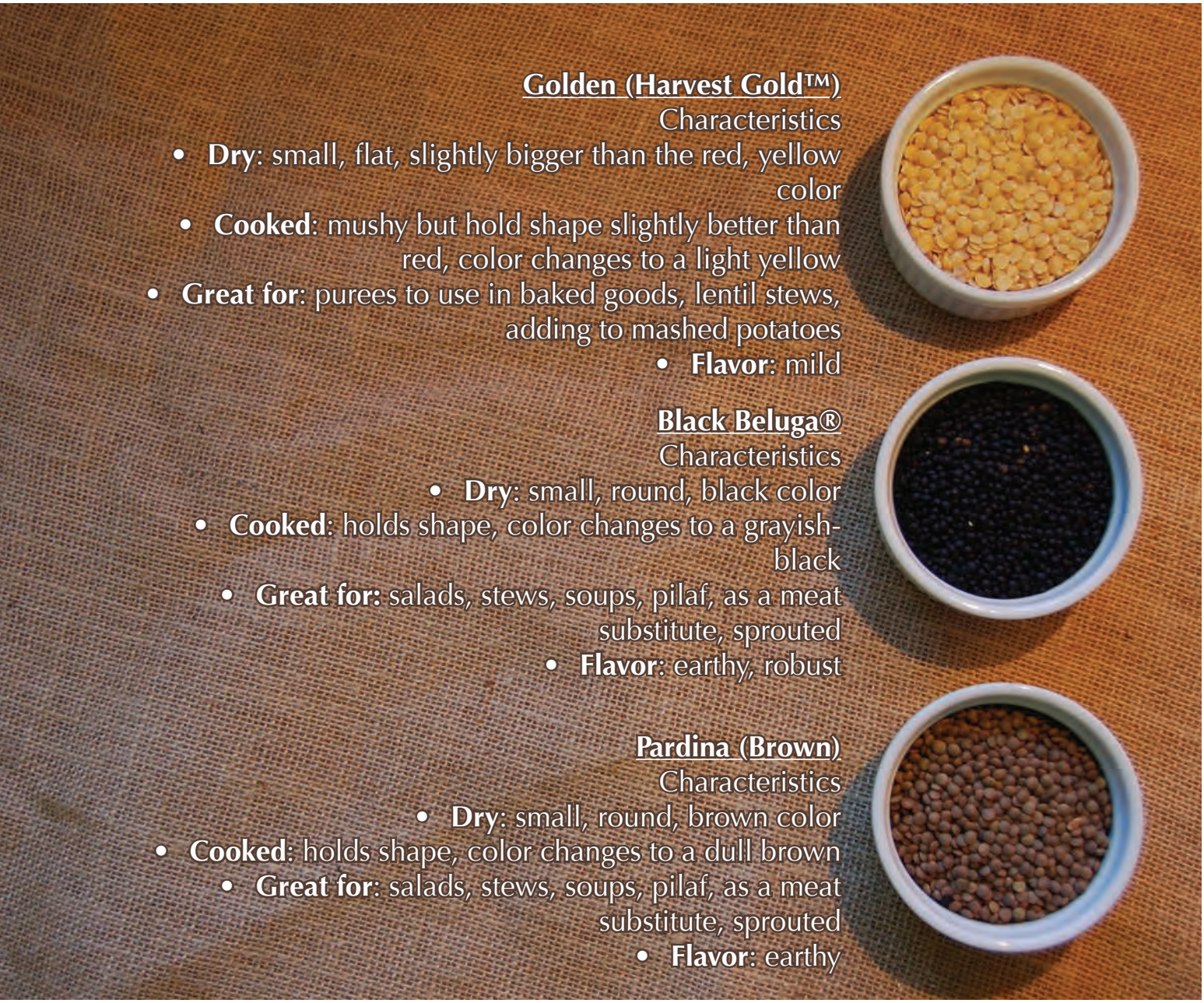
French Green:
Characteristics

- **Dry**: small, round, greenish-blue color
- **Cooked**: holds shape, color changes to a dull green (if soaked, however, the color stays brighter)
- **Great for**: salads, stews, soups, pilaf, sprouted
- **Flavor**: earthy

Table 13: Volume Analysis of 1 Pound Lentils Dry and Cooked

Lentil Type	Starting Measure, Dry	Cups, Dry	Cups, Cooked	# of Servings
Petite Crimson™ (Red)	1 pound	2 1/3 cups	4 1/2 cups	9
Black Beluga®	1 pound	2 1/3 cups	6 1/3 cups	12.6
Green	1 pound	2 2/3 cups	7 1/2 cups	15
Pardina (Brown)	1 pound	2 1/3 cups + 1 tablespoon	6 2/3 cups	13.3
French Green	1 pound	2 1/2 cups + 1 tablespoon	7 cups	14
Havest Gold™	1 pound	2 1/3 cups + 2 1/2 teaspoons	6 1/3 cups	12.6

Serving size: 1/2 cup cooked
Timeless Seeds, Inc lentils were measured using their 1 pound bags sold in retail stores.



Golden (Harvest Gold™)
Characteristics
- **Dry**: small, flat, slightly bigger than the red, yellow color
- **Cooked**: mushy but hold shape slightly better than red, color changes to a light yellow
- **Great for**: purees to use in baked goods, lentil stews, adding to mashed potatoes
- **Flavor**: mild

Black Beluga®
Characteristics
- **Dry**: small, round, black color
- **Cooked**: holds shape, color changes to a grayish-black
- **Great for:** salads, stews, soups, pilaf, as a meat substitute, sprouted
- **Flavor**: earthy, robust

Pardina (Brown)
Characteristics
- **Dry**: small, round, brown color
- **Cooked**: holds shape, color changes to a dull brown
- **Great for**: salads, stews, soups, pilaf, as a meat substitute, sprouted
- **Flavor**: earthy

Bean and Lentil Flour

Legumes, including lentils, of all shapes and sizes can be ground into flour to use in baked goods or even used as thickeners in soups and stews. Using legume flour increases the protein, fiber, and iron content of the recipe. Since these flours are gluten free, they can be used in creating gluten free flour mixes.

There are two ways to make lentil flour. The first method involves soaking the lentils first and the second method grinds dry lentils into a powder.

Method 1 (WET): Soak the lentils
Place lentils in cool water. Soak for 12-24 hours under refrigeration. If soaking for 24 hours, change the soaking liquid one time during the soaking process. Drain the soaked lentils and grind into a paste. Since the lentils are moist and not dry, this will affect the moisture content of the recipe and adjustments will need to be made to the amount of dry ingredients (wheat flour, etc) used. Generally, increasing the wheat flour by 1/4 of a cup per 1 cup of lentil flour/paste added will provide the proper adjustment. Refer to Table 3.3 to see volume differences when the lentils are soaked. 1 cup soaked lentils = about 1.5 cups lentil paste/flour.

Method 2 (DRY): Grind dry lentils
Using a flour mill, blender, or coffee grinder, pulse the dry lentils until powdery. The lentil flour can be used in yeast or quick bread recipes. 1 cup dry lentils = 1 cup lentil flour.

Dried beans or lentils can be roasted prior to grinding to add a nuttier flavor to the flour. Roast the dried beans or lentils for 20 minutes in a 400ºF oven. Cool and grind as you would in Method 2.

Soaking Lentils

Soaking lentils is a great way to increase the bioavailability of nutrients. Simply soak 1 cup of lentils like you would if soaking dried beans overnight. For purposes of reducing the risk of food borne illness, it is recommended to soak the lentils in cool water under refrigeration for 10-12 hours (overnight).

Any lentil can be soaked prior to cooking. The next day, drain the lentils and cook according to the recipe's instructions -- add to stews, soups, purees, or grind into a flour or paste. The cooking time for the lentils will decrease by about half. Table 14 shows the volume of each lentil after it soaks and is cooked.

Table 14: Volume Analysis of 1 cup of Lentils Soaked and Cooked

Lentil Type	Starting Measure, dry	Cups, soaked	Cups, cooked
Petite Crimson™ (Red)	1 cup	2 1/4 cups	2 1/3 cups +1 tablespoon
Black Beluga®	1 cup	2 1/2 cups	4 cups
Green	1 cup	2 1/3 cups	3 cups
Pardina	1 cup	2 1/4 cups	3 cups
French Green	1 cup	2 1/3 cups + 1 tablespoon	2 3/4 cups
Harvest Gold™	1 cup	2 1/4 cups	3 cups

Lentils were soaked for a minimum of 8 hours.

Lentil Puree

Using lentils in baked goods, like in cakes, cookies, and quick breads, requires the lentils to be cooked prior to baking and pureed. Any lentil variety can be used for puree, but the best types are red, golden, and standard green lentils. In Table 15, the characteristic of each lentil puree is listed. Red lentil puree cooks up very watery, while the Harvest Gold™ puree is pasty but moist. Lentil purees are great for use in recipes using whole wheat flour because they reduce the chance of the end product being dry and crumbly. If using Harvest Gold™ pureed lentils in a baked good recipe, increase the whole wheat flour by 1/3 cup (more for red lentil puree) per 1 cup puree used. For green lentil puree, an adjustment to the wheat flour is generally not needed. The puree can be made ahead of time and refrigerated for up to 4 days or frozen for up to 6 months.

Standard Lentil puree:
yield varies by lentil (see Table 15)

1 cup red, yellow, or green lentils
about 2 cups water

In a small pot, combine the lentils and water. Bring to a boil. Reduce heat to low; cover and cook for 25-30 minutes or until the lentils are soft and tender. Drain well. Puree the lentils in a food processor until smooth. Allow the mixture to cool to room temperature before using in the recipe.

Puree can be refrigerated for up to 4 days or frozen for up to 6 months.

Table 15: Volume Analysis of 1 Cup of Lentils Cooked and Pureed

Lentil Type	Starting Measure, Dry	Cups, Cooked	Cups, Pureed	Characteristics of the Puree
Petite Crimson™ (Red)	1 cup	2 1/8 cups	2 cups	Watery
Black Beluga®	1 cup	3 1/3 cups	2 1/3 cups	Dry
Green	1 cup	3 cups	3 cups	Pasty
Pardina (Brown)	1 cup	3 cups	2 1/3 cups	Very Dry
French Green	1 cup	2 3/4 cups	2 1/3 cups + 1 1/2 tablespoons	Dry/pasty
Havest Gold™	1 cup	2 3/4 cups	2 1/3 cups	Pasty/moist

Timeless Seeds, Inc lentils were used.

Brined Lentils

Lentils can also be brined in a salt solution prior to cooking. This method is great for salads and prevents the lentil skins from popping open during cooking, and thus adding to the aesthetic quality of the salad.

Brined Lentils:

1 cup French green, Pardina, or Black Beluga® lentils
6 cups water
2 cups vegetable or chicken stock (preferrably low sodium)
4 garlic cloves, smashed
1 bay leaf
3 teaspoons Kosher salt

Place lentils and 2 teaspoons of salt in a bowl. Cover with 4 cups lukewarm water and soak for 1 hour. Drain well. Drained lentils can be covered and refrigerated for up to 2 days before cooking.

Adjust oven rack to middle position and heat oven to 325°F.

Place drained lentils, 2 cups water, vegetable or chicken stock, garlic, bay leaf, and 1 teaspoon salt in a medium oven-proof saucepan or baking dish. Cover and bake until lentils are tender but remain intact, 40-60 minutes.

Drain lentils. Discard garlic and bay leaf. Allow to cool and then toss in your favorite vinaigrette or use in recipes on pages 35-36.

Margaret Corcoran
Executive Chef
Benny's Bistro, Helena

Chef Margaret Corcoran
Photo courtesy of Margaret Corcoran

Benny's Bistro opened in Helena in 1995 as a sandwich shop before moving to its current location in 2001.

After developing a relationship with Anna Jones and Doug Crabtree, Chef Margaret became familiar with Timeless Seeds and how many lentils are grown in Montana.

According to Chef Margaret, putting lentils on the menu requires educating the public, not just about lentils but all locally sourced products like grass fed beef and vegetables. Utilizing locally sourced products requires an educated staff, as well.

On the menu, Benny's Bistro features lentils in their Lentil Burger and Lentil Rice Pilaf that is served with dinner. They frequently include lentils in soups and make a salmon dish utilizing Black Beluga® lentils from Timeless Seeds. On their catering menu is a delicious dish featuring lentils with beets and fresh ginger.

I got to know Anna and Doug [Crabtree] and became a lentil fanatic. - Margaret

Benny's Bistro is located at 108 6th Street in Helena. For more information, visit www.bennysbistro.com.

Jenny Montague
Food Service Director
Kalispell Public Schools

Jenny Montague, MS, RD, is the Food Service Director for Kalispell Public Schools, and serves as a board member for Nourish the Flathead and Flathead Farm to School.

Jenny Montague
Photo courtesy of Jenny Montague

Jenny sources locally in order to provide students with fresh healthful food. Many of the foods Montana produces are long time staples in the school lunch menu. Direct sourcing is a natural and affordable choice for Montana with items such as meat, grain and legumes. Additionally, local sourcing fosters local pride through an improved local economy and a sense of self-sufficiency.

According to Jenny, students react to local foods in a wide variety of ways. "They are pleased to see fresh items on the menu, regardless of where they are coming from. Some students are familiar with farming and ranching in the area, and are happy to know that we are choosing to source locally. Some are aware of food system issues and are allies in our mission to be a part of positive change. Many times, we replace an ingredient in a recipe with a local product and students don't seem to notice. New menu choices often need to be taste tested and tweaked until we find something popular - but overall students are much more open-minded than any of the school staff or administration expected them to be."

Students are pleased to see fresh items on the menu, regardless of where they are coming from. -Jenny

Jenny likes incorporating lentils into school meals because lentils are so versatile! They can be served cold in a salad on the salad bar, or incorporated into any casserole or ground beef dish. Her favorite thing about lentils is that they are a healthy, affordable protein source grown in Montana. Specifically, Jenny uses lentils in cold salads (because then lentils get the credit they deserve!), or as a component of hummus. They can also be incorporated into ground beef entrees like sloppy joe and taco meat.

Martin Lewis
Executive Chef of the Dining Halls
Montana State University, Bozeman

Originally hailing from New York, Martin Lewis attended the Culinary Art Institute of New York.

The possibilities for lentil consumption in the university food system in regards to specialty diets or allergies are incredible.
-Martin

Chef Martin Lewis

Martin then moved to Montana in 2003 cooking at various dude ranches. He provided guests with excellent meals featuring local ingredients to showcase the bounty of the Montana landscape. Martin is a firm proponent of incorporating local ingredients into his menu planning and is also a firm supporter of higher education. His recent hire at Montana State University fit perfectly with the university food service's mission of incorporating more Montana made products.

RECIPES

As noted in the previous sections, lentils are incredibly nutritious and can be used in a variety of ways in the kitchen. The following recipes illustrate the versatility of lentils from being used in hummus to being used as a puree in baked goods.

Bon Appetit!

Chocolate Cake, page 41

Lentil Hummus

Serving Size: 2 tablespoons

Cooking Time 20-25 min; Total time: 2 hr

INGREDIENTS	30 SERVINGS (4 cups; 1 quart)	60 SERVINGS (8 cups; 2 quarts)	100 SERVINGS (3 1/2 quarts)
Red or Golden Lentils, dry	1 cup	2 cups	3 1/3 cups
Chickpeas, canned, drained and rinsed	15 ounces	30 ounces	50 ounces
Roasted Red Bell Peppers	1 cup	2 cups	3 1/3 cups
Tahini	1/4 cup	1/2 cup	3/4 cup
Lemon Juice	3 tablespoons	1/3 cup	2/3 cup
Olive Oil	3 tablespoons	1/3 cup	2/3 cup
Garlic, crushed	2 cloves	4 cloves	6 cloves
Salt	1-2 teaspoons	2-3 teaspoons	1 tablespoon
Pepper	1 teaspoon	2 teaspoons	1 tablespoon

Directions:

Place the lentils in saucepan and cover with water by 2-inches. Bring to a boil; reduce heat to low. Cover and simmer for 20-25 minutes or until the lentils are soft and mushy. Drain the lentils. Set aside for about 20 minutes to cool.

Place the lentils, chickpeas, peppers, tahini, lemon juice, and garlic in a food processor. Pulse several times until finely chopped. Scrape down the sides of the bowl. Turn on the processor and slowly add the olive oil while the motor is running. Add enough olive oil to get desired consistency. Add salt and pepper to taste.

Pour hummus into a bowl. Cover and refrigerate for at least 1 hour before serving. Hummus will keep in the refrigerator for 4-5 days.

Nutrition Info:
Per serving (2 T)

Calories, 64 kcal
Protein, 3 g
Carbohydrates, 7 g
Total fat, 3 g
Cholesterol, 0 mg
Saturated fat, 0.4 g
Dietary Fiber, 3 g
Sugars, 1 g
Sodium, 173 mg
Folate, 40 µg
Potassium, 98 mg
Vitamin A, 30 IU

Tomato Lentil Soup

Serving Size: 1 cup

Cooking Time 40 min; Total time: 1 hr

INGREDIENTS	15 SERVINGS (4 quarts; 1 gallon)	25 SERVINGS (6 1/2 quarts; 1 gallon, 2 1/2 quarts)	50 SERVINGS (3 1/4 gallons)
Olive oil	2 1/2 tablespoons	4 tablespoons	8 tablespoons
Carrots, diced small	5 medium	8 medium	16 medium
White onion, diced small	2 1/2 medium	5 medium	8 medium
Serrano chili, minced	2 1/2 each	4 each	8 each
Garlic cloves, minced	5 each	8 each	16 each
Tomato paste	2 1/2 tablespoons	1/4 cup	1/2 cup
Lentils (red or golden)	1 2/3 cups	2 2/3 cups	5 1/2 cups
Whole roma tomatoes, canned	70 oz	112 oz	232 oz
Vegetable stock	2 1/2 quarts	1 gallon	2 gallons
Salt	1 teaspoon	2 teaspoons	4 teaspoons
Pepper	1 teaspoon	2 teaspoons	4 teaspoons

Directions:

Heat olive oil over medium heat in a large pot. Add the carrots and onions. Saute for 5-8 minutes, until soft. Season lightly with salt and pepper. Add the chili pepper, garlic, and tomato paste. Saute for 3-4 minutes. Add the lentils, tomatoes, and stock. Season lightly with salt and pepper. Cook over medium-low heat for 20-30 minutes or until the lentils are soft.

Serve in warm bowl.

Nutrition Info:
Per serving (1 cup)

Calories, 106 kcal
Protein, 5 g
Carbohydrates,17 g
Total fat, 3 g
Cholesterol, 0 mg
Saturated Fat, 0.4 g
Dietary fiber, 3.2 g
Sugars, 7 g
Sodium, 878 mg
Folate, 37 µg
Potassium, 592 mg
Vitamin A, 1984 IU

Thai Red Lentil and Winter Squash Bisque

Serving Size: 1 cup

Cooking Time 40-50 min; Total time: 1 hr

INGREDIENTS	12 SERVINGS (3 quarts)	24 SERVINGS (6 quarts; 1 1/4 gallons)	48 SERVINGS (3 gallons)
Acorn squash, medium size	2 each	4 each	8 each
Olive oil	2 tablespoons	1/4 cup	1/2 cup
Fresh ginger, minced	1/3 cup	2/3 cup	1 1/3 cups
Garlic cloves, minced	2 each	4 each	8 each
Yellow onion, diced	2 each	4 each	8 each
Thai red chili paste (Sambal)	2 tablespoons	1/4 cup	1/2 cup
Vegetable stock	2 quarts	1 gallon	2 gallons
Red lentils	3 cups	6 cups	12 cups
Coconut milk, canned	2 cups	1 quart	2 quarts
Salt	2 teaspoons	1 tablespoon	2 tablespoons
Pepper	1 teaspoon	2 teaspoons	4 teaspoons
Lime juice, fresh	2 limes	4 limes	8 limes
Cilantro, finely chopped	1 tablespoon	2 tablespoons	1/4 cup

Directions:

The lentils can be soaked ahead of time for 8-12 hours under refrigeration.

Preheat the oven to 375ºF. Line a baking sheet with foil and brush with a teaspoon of olive oil. Place the acorn squash flesh side down on the foil. Bake until the squash is tender, about 20-30 minutes. Remove from oven and set aside to cool slightly. Peel off the skin and scoop out the flesh. Reserve the flesh for the soup.

In a saucepan, heat the remaining olive oil over medium heat. Add the ginger, garlic, and onion. Sauté for 5-7 minutes or until the vegetables are soft. Add the Thai red chili paste; sauté for 1-2 minutes. Add the stock and the lentils. Season lightly with salt and pepper. Bring up to a boil and then reduce the heat to simmer. Simmer until the lentils are cooked, about 20-25 minutes. Add the squash to the soup. Cook for another 10 minutes. With a hand blender, puree the soup until smooth. Add the coconut milk and lime juice and blend to incorporate. Season to taste with the salt and pepper. Stir in the chopped cilantro before serving.

Nutrition Info:
Per serving (1 cup)

Calories, 329 kcal
Protein, 14 g
Carbohydrates, 43 g
Total fat, 13 g
Cholesterol, 0 mg
Saturated Fat, 8.9 g
Dietary fiber, 17 g
Sugars, 3 g
Sodium, 400 mg
Potassium, 880 mg
Vitamin A, 6%

Lettuce Wraps with Lentils & Raspberry Vinaigrette

Serving Size: 1 tablespoon (Vinaigrette) and 1 Wrap Cooking Time 30 min; Total time: 1 hr

INGREDIENTS: Raspberry Vinaigrette	15 SERVINGS (1 1/4 cup)	25 SERVINGS (2 cups)	50 SERVINGS (4 cups)
Raspberry Balsamic Vinegar	1/3 cup	1/2 cup	1 cup
Dijon Mustard	2 1/2 teaspoons	1 tablespoon + 1 teaspoon	2 1/2 tablespoons
Honey	2 1/2 teaspoons	1 tablespoon + 1 teaspoon	2 1/2 tablespoons
Garlic clove, minced	2 each	4 each	8 each
Olive oil	2/3 cup	1 cup	2 cups
Salt	1 teaspoon	2 teaspoons	1 tablespoon
Pepper	1/2 teaspoon	1 teaspoon	2 teaspoons

INGREDIENTS: Lettuce Wrap	15 SERVINGS	25 SERVINGS	50 SERVINGS
French green lentils, dry	2 1/2 cups	4 cups	8 cups
Almonds, sliced	2/3 cup	1 cup	2 cups
Shallots, minced	2/3 cup	1 cup	2 cups
Raspberry Vinaigrette	1 1/4 cups	2 cups	4 cups
Strawberries, sliced	1 1/4 cups	2 cups	4 cups
Feta cheese, crumbled	2/3 cup	1 cup	1 cup
Red or Green leaf lettuce leaves	15 leaves	25 leaves	50 leaves

Directions:

Vinaigrette:
Whisk together the vinegar, mustard, honey, and garlic. Slowly whisk in the olive oil to create an emulsion. Season to taste with salt and pepper.

Lettuce Wraps:
Place the lentils in a pot and cover with water by 2 inches. Bring to a boil; reduce heat and cover. Cook until lentils are soft, about 20-30 minutes.

In a bowl, toss together lentils, almonds, shallots, and vinaigrette. Let sit at room temperature for 15 minutes or refrigerate for up to an hour. Carefully toss in the berries and feta cheese.

Place the lettuce leaves on a plate and fill each leaf with a 1/2 cup lentil mixture. Add more berries and cheese if desired.

Nutrition Info:
Per serving (1 Wrap)

Calories, 234 kcal
Protein, 11 g
Carbodydrates, 25 g
Total Fat, 11 g
Cholesterol 6 mg
Saturated Fat, 2 g
Dietary Fiber, 11 g
Sugars, 3 g
Sodium, 234 mg
Folate, 178 µg
Potassium, 416 mg
Vitamin A, 120 IU

Beet & Lentil Salad with Sherry Walnut Vinaigrette

Serving Size: 1 tablespoon (Vinaigrette); 3/4 cup salad Cooking Time 40 min; Total time: 1 hr

INGREDIENTS: Sherry Walnut Vinaigrette	15 SERVINGS (1 1/4 cups)	25 SERVINGS (2 cups)	50 SERVINGS (4 cups)
Sherry Vinegar	1/3 cup	1/2 cup	1 cup
Dijon Mustard	2 1/2 teaspoons	1 tablespoon + 1 teaspoon	2 1/2 tablespoons
Honey	2 1/2 teaspoons	1 tablespoon + 1 teaspoon	2 1/2 tablespoons
Garlic clove, minced	2 each	4 each	8 each
Olive oil	2/3 cup	1 cup	2 cups
Salt	1 teaspoon	2 teaspoons	1 tablespoons
Pepper	1/2 teaspoon	1 teaspoons	2 teaspoons

INGREDIENTS: Lentil Salad	10 SERVINGS	25 SERVINGS	50 SERVINGS
Beluga (black) Lentils®, dry	2 1/2 cups	4 cups	8 cups
Beets, cooked, peeled, diced	10 medium	16 medium	32 medium
Walnuts, roughly chopped	2/3 cup	1 cup	2 cups
Red onion, diced	2/3 cup	1 cup	2 cups
Parsley, chopped	2/3 cup	1 cup	2 cups
Bok choy, chopped	5 cups	8 cups	16 cups
Goat cheese, crumbled	6 ounces	10 ounces	1 1/4 pounds
Sherry Walnut Vinaigrette	1 1/4 cups	2 cups	4 cups

Directions:

Vinaigrette:
Whisk together the vinegar, mustard, honey, and garlic. Slowly whisk in the olive oil to create an emulsion. Season to taste with salt and pepper

Salad:
Place the lentils in a pot and cover with water by 2 inches. Bring to a boil; reduce heat and cover. Cook until lentils are soft, about 20-30 minutes.

Toss together the lentils, beets, walnuts, onions, parsley, bok choy, and goat cheese. Add the vinaigrette. Toss carefully. Let sit at room temperature for 15 – 20 minutes or refrigerate for up to one hour before serving.

Nutrition Info:
Per serving (3/4 cup salad)
Calories, 259 kcal
Protein, 13 g
Carbodydrates, 25 g
Total Fat, 12 g
Cholesterol, 11 mg
Saturated Fat, 4 g
Dietary Fiber, 11 g
Sugars, 4 g
Sodium, 276 mg
Folate, 197 µg
Potassium, 498 mg
Vitamin A, 1274 IU

Lentil Burgers with Herbed Goat Cheese

Serving Size: 1 patty, about 3 oz (1/4 cup)

Cooking Time 40 min; Total time: 1 hr

INGREDIENTS: Lentil Burger	15 SERVINGS	25 SERVINGS	50 SERVINGS
Vegetable stock	4 cups	6 cups	12 cups
Green lentils, dry	2 cups	3 cups	6 cups
Olive oil	2 tablespoons	3 tablespoons	6 tablespoons
Red onion, diced small	1 each	2 each	4 each
Carrots, diced small	2 each (medium size)	3 each (medium size)	6 each (medium size)
Garlic cloves, minced	4 each	6 each	12 each
Eggs, large	4 each	6 each	12 each
Parsley, chopped	1/4 cup	1/2 cup	1 cup
Bread crumbs, plain	1 1/2 cup	3 cups	6 cups
Parmesan cheese, grated	1/2 cup	1 cup	2 cups
Cayenne pepper, ground	1/2 teaspoon	1 teaspoon	2 teaspoons
Pepper	1 teaspoon	2 teaspoons	4 teaspoons
Salt	2 teaspoons	1 tablespoons	2 tablespoons
Canola oil, for pan frying	1/4 cup	1/2 cup	1 cup

INGREDIENTS: Herbed Goat Cheese	15 SERVINGS	25 SERVINGS	50 SERVINGS
Goat cheese, plain	8 ounces	12 ounces	24 ounces (1 1/2 pounds)
Garlic cloves, minced	2 each	3 each	6 each
Fresh herbs, chopped (mix of thyme, oregano, basil, sage)	1/4 cup	1/2 cup	1 cup
Salt	1/2 teaspoon	1 teaspoon	2 teaspoons
Pepper	1/2 teaspoon	1 teaspoon	2 teapspoons

Directions:

In a saucepan, combine the vegetable stock and lentils. Bring to a boil; cover and reduce heat to low. Simmer until lentils are soft, about 30 minutes.

In a small bowl, mix together the goat cheese, garlic, herbs, salt, and pepper. Set aside.

In a sauté pan, heat the olive oil over medium heat. Add the diced onions and carrots. Saute for 5-6 minutes or until soft. Put cooked onion and carrot in a bowl. When the lentils are cooked, drain and allow to cool for 15-20 minutes. Add the lentils to the carrots and onions. Add the garlic, parsley, eggs, parmesan cheese, bread crumbs, cayenne, salt, and pepper. Mix well while pressing down to mash the lentils.

Heat the canola oil in a non-stick sauté pan over medium high heat. Form the lentil mixture into patties. Place the patties in the hot oil. Fry on each side until nicely browned, about 3 minutes per side.

Serve on a toasted bun with the goat cheese and other burger toppings.

Nutrition Info for 1 Lentil Patty, no bun, no cheese:

Calories, 190 kcal
Protein, 9 g
Carbodydrates, 23 g
Total Fat, 7 g
Cholesterol, 2 mg
Saturated Fat, 1 g
Dietary Fiber, 8 g
Sugars, 2
Sodium, 540 mg
Folate, 127 µg
Potassium, 338 mg
Vitamin A, 663 IU

Nutrition Info for 1 4-oz Hamburger Patty, no bun, no cheese

Calories, 286 kcal
Protein, 31 g
Carbodydrates, 0 g
Total Fat, 17 g
Cholesterol, 100 mg
Saturated Fat, 6 g
Dietary Fiber, 0 g
Sugars, 0 g
Sodium, 415 mg
Folate, 11 µg
Potassium, 454 mg
Vitamin A, 0 IU

Why choose a Lentil Burger?
The lentil burger provides full enjoyment, complete satisfaction and is totally guilt free. When compared to its standard counterpart, the lentil burger has 143% less total fats with only 1 gram of saturated fat and 2 miligrams of cholesterol. In addition, one patty includes 36% of the recommended daily intake of fiber. And still, the lentil burger packs the protein punch that you're wanting from a burger, along with a complexity of flavors and spices that brings depth to this American favorite.

Lentil Mash

Serving Size: 1/4 cup

Cooking Time 30 min; Total time: 45 min

INGREDIENTS	10 SERVINGS	25 SERVINGS	50 SERVINGS
Olive oil	1 tablespoon	1/4 cup	1/2 cup
Carrots or sweet potatoes, peeled, cut into 1-inch chunks*	5 medium	12 medium	25 medium
Red onion, cut into 1-inch chunks	1 medium	2 medium	4 medium
Garlic clove, crushed	2	4	8
Red or Golden lentils, dry	1 cup, dry	2 cups, dry	4 cups, dry
Salt	1 teaspoon	2 teaspoons	1 tablespoon
Pepper	1/2 teaspoon	1 teaspoon	2 teaspoons
Ancho pepper, ground	1/2 teaspoon	1 teaspoon	2 teaspoons
Cumin, ground	1/2 teaspoon	1 teaspoon	2 teaspoons
Cayenne pepper, ground	1/4 teaspoon	1/2 teasoon	3/4 teaspoon

Directions:

Preheat oven to 375ºF.

Toss the carrots and onions in the olive oil. Spread onto a baking sheet. Bake until carrots are fork tender, about 20 minutes.

In the meantime, cook the lentils. Place the lentils in a saucepot. Cover by 2 inches. Cook lentils until soft, about 20 minutes. Drain.

Place the carrots, onions, and garlic in a food processor. Pulse 10-15 times to chop up the vegetables. Add the cooked lentils. Pulse a few more times to achieve a chunky consistency.

Place the puree in a bowl. Season with spices, salt, and pepper. Serve along side any meat dish in place of mashed potatoes.

**Any root vegetable can be used: parsnips, turnips, potatoes, sweet potatoes, beets*

Nutrition Info:
Per serving (1/4 cup)

Calories, 59 kcal
Protein, 2 g
Carbodydrates, 8 g
Total Fat, 3 g
Cholesterol, 0 mg
Saturated Fat, .4 g
Dietary Fiber, 2 g
Sugars, 2 g
Sodium, 216 mg
Folate, 20 µg
Potassium, 149 mg
Vitamin A, 5100 IU

Masur Dal

Serving Size: 1/2 cup

Cooking Time 25 min; Total time: 45 min

INGREDIENTS	15 SERVINGS (7.5 cups)	25 SERVINGS (3 quarts)	50 SERVINGS (6 quarts)
Red lentils, dry	1 1/4 pound	2 pound	4 pound
Yellow Onion, diced small	5 medium	8 medium	16 medium
Garlic cloves, minced	5 each	8 each	16 each
Jalapeno, minced	2 each	4 each	8 each
Ghee or clarified butter	2/3 cup + 2 tablespoons	1 cup + 1/4 cup	2 cups + 1/2 cup
Coriander, ground	2 1/2 tablespoons	1/4 cup	1/2 cup
Turmeric, ground	2 1/2 teaspoons	1 tablespoon + 1 teaspoon	2 1/2 tablespoons
Cumin, ground	2 1/2 teaspoons	1 tablespoon + 1 teaspoon	2 1/2 tablespoons
Salt	1 teaspoon	2 teaspoons	1 tablespoon
Pepper	1/2 teaspoon	1 teaspoon	2 teaspoons
Sour cream	2/3 cup	1 cup	2 cups
Coriander seeds	1 1/2 tablespoons	2 1/2 tablespoons	1/4 cup
Shallots, sliced thin	10 each	16 each	32 each

Directions:

Rinse the lentils and cover with water by 2 inches. Bring to a boil and then reduce the heat to low. Cook until very soft, about 10-15 minutes. Drain well, reserving the liquid.

Heat 2/3 cup butter in a pan and sauté the onions, garlic, and chili pepper for 3 minutes or until soft. Add the spices and cook for another 2 minutes. Add the lentils and heat through. Season with salt and pepper.

Stir in the sour cream and some of the reserved liquid if the stew seems too thick. Heat the remaining 2 tablespoons butter over medium heat and add the coriander seeds and shallots. Sauté for about 1-2 minutes. Add to the stew. Serve.

Nutrition Info:
Per serving (1/2 cup)

Calories, 263 kcal
Protein, 9 g
Carbodydrates, 27 g
Total Fat, 14 g
Cholesterol, 35 mg
Saturated Fat, 8 g
Dietary Fiber, 11 g
Sugars, 4 g
Sodium, 403 mg
Folate, 168 µg
Potassium, 450 mg
Vitamin A, 447 IU

Enough Protein For the Vegan/Vegetarian?
Yes, it is. According to the Academy of Nutrition and Dietetics, a well-rounded vegetarian diet can provide all the amino acids necessary to make the proteins the body needs to function and grow. For those vegetarians or vegans who consume a lot of cereal or grains which are typically low in lysine, deliberate intake of foods that are high in lysine is encouraged. With the daily recommendation of 12 mg/kg, a 150 lb individual would need 816 mg of lysine. Lentils are a perfect choice with 630 mg included in ½ cup of cooked green lentils.

Chocolate Cake

Serving Size: 1 slice

Cooking Time 1 1/4 hr; Total time: 1 1/2 hr

INGREDIENTS: Chocolate Cake	24 SERVINGS 2 9-inch round cakes, 12 slices per cake	48 SERVINGS 4 9-inch round cakes, 12 slices per cake	96 SERVINGS 8 9-inch round cakes, 12 slices per cake
Sugar, granulated or raw	1 1/2 cups	3 cups	6 cups
Honey	1/2 cup	1 cup	2 cups
Olive oil	3/4 cup	1 1/2 cups	3 cups
Eggs, large	3 each	6 each	12 each
Lentil puree*	1 1/2 cups	3 cups	6 cups
Water	1 1/4 cups	2 1/2 cups	5 cups
Espresso powder	1 teaspoon	2 teaspoons	4 teaspoons
Vanilla extract	1 teaspoon	2 teaspoons	4 teaspoons
Whole wheat flour	2 1/2 cups	5 cups	10 cups
Cocoa powder	1/2 cup	1 cup	2 cups
Baking soda	1 teaspoon	2 teaspoons	4 teaspoons
Salt	1 teaspoon	2 teaspoons	4 teaspoons

INGREDIENTS: Lentil Puree*	24 SERVINGS 1 1/2 cups	48 SERVINGS 3 cups	96 SERVINGS 6 cups
Lentils (green or golden), dry	1/2 cup	1 cup	2 cups
Water	2 cups	3 cups	6 cups

Directions:

Lentil Puree

Place the lentils and water in a saucepan. Bring to a boil. Cover and reduce heat to low. Cook until the lentils are tender, about 40 minutes. Drain (reserve a little cooking liquid) and puree lentils in a food processor until smooth. Add a little cooking liquid if the lentils seem too dry. The puree will keep in the refrigerator for 3-4 days and can be frozen for a later use.

Chocolate Cake

Preheat oven to 350° F. Generously grease and flour cake pans. Set aside.

In a mixing bowl, cream together the sugar, honey, and oil. Add the eggs one at a time to incorporate well. Add the lentil puree and water. In a small bowl, mix together the whole wheat flour, cocoa powder, baking soda and salt. Add the dry ingredients to the wet ingredients, mixing well. Pour batter into the prepared cake pans. Bake for 30-35 minutes or until a toothpick inserted in the center comes out clean.

Remove from oven and cool on a rack for 10 minutes. Remove cakes from the pans and cool completely. Dust with powdered sugar.

Nutrition Info:
Per serving (1 slice)

Calories, 200 kcal
Protein, 4 g
Carbodydrates, 31 g
Total Fat, 8 g
Cholesterol, 25 mg
Saturated Fat, 1 g
Dietary Fiber, 3 g
Sugars, 19 g
Sodium, 126 mg
Folate, 31 µg
Potassium, 139 mg
Vitamin A, 43 IU

Gluten Free Chocolate Cake

Serving Size: 1 slice

Cooking Time 1 1/4 hr; Total time: 1 1/2 hr

INGREDIENTS: GF Chocolate Cake	24 SERVINGS 2 9-inch round cakes, 12 slices per cake	48 SERVINGS 4 9-inch round cakes, 12 slices per cake	96 SERVINGS 8 9-inch round cakes, 12 slices per cake
Semi-sweet chocolate chips, melted	20 ounces	2 1/2 pounds	5 pounds
Lentil puree*	1 1/2 cups	3 cups	6 cups
Lentil flour, wet (page 28)	1 1/2 cups	3 cups	6 cups
Eggs, large	8 each	16 each	32 each
Sugar	1 1/2 cups	3 cups	6 cups
Espresso powder	2 teaspoons	4 teaspoons	2 1/2 tablespoons
Vanilla extract	2 teaspoons	4 teaspoons	2 1/2 tablespoons
Baking powder	1 teaspoon	2 teaspoons	1 tablespoon

INGREDIENTS: Lentil Puree*	24 SERVINGS 1 1/2 cups	48 SERVINGS 3 cups	96 SERVINGS 6 cups
Lentils (green or golden), dry	1/2 cup	1 cup	2 cups
Water	2 cups	3 cups	6 cups

Directions:

Lentil Puree

Place the lentils and water in a saucepan. Bring to a boil. Cover and reduce heat to low. Cook until the lentils are tender, about 40 minutes. Drain (reserve a little cooking liquid) and puree lentils in a food processor until smooth. Add a little cooking liquid if the lentils seem too dry. The puree will keep in the refrigerator for 3-4 days and can be frozen for a later use.

Chocolate Cake

Preheat oven to 350ºF. Grease a 9-inch cake pan.

In the bowl of a food processor combine the melted chocolate, lentil puree, lentil flour, eggs, and sugar. Puree the mixture until smooth. Add the baking powder, vanilla, and espresso. Pulse a couple times to mix well.

Pour batter into the greased cake pan. Bake for 25-30 minutes or until a toothpick inserted in the center comes out clean.

Cool completely before serving. Dust with powdered sugar.

Nutrition Info:
Per serving (1 slice)

Calories, 265 kcal
Protein, 9 g
Carbodydrates, 41 g
Total Fat, 8 g
Cholesterol, 62 mg
Saturated Fat, 2 g
Dietary Fiber, 8 g
Sugars, 22 g
Sodium, 102 mg
Potassium, 247 mg
Vitamin A, 2%

Chocolate Chip Cookies

Serving Size: 1 cookie

Cooking Time 55 min; Total time: 1 1/4 hr

INGREDIENTS Chocolate Chip Cookies	3 DOZEN	6 DOZEN	9 DOZEN
Whole wheat flour	3 cups	6 cups	9 cups
Rolled oats	1 cup	2 cups	3 cups
Baking soda	1 teaspoon	2 teaspoon	1 tablespoon
Baking powder	1/2 teaspoon	1 teaspoon	1 1/2 teaspoons
Salt	1 teaspoon	2 teaspoons	1 tablespoon
Sugar, granualted or raw	1 1/2 cups	3 cups	4 1/2 cups
Butter, unsalted	1 cup (8 ounces)	2 cups (1 pound)	3 cups (1 1/2 pounds)
Eggs, large	2 each	4 each	6 each
Vanilla extract	2 teaspoons	1 tablespoon + 1 teaspoon	2 tablespoons
Lentil puree*	1 1/2 cups	3 cups	4 1/2 cups
Chocolate Chips, semi-sweet	12 ounces	24 ounces	36 ounces

INGREDIENTS: Lentil Puree*	3 DOZEN 1 1/2 cups	6 DOZEN 3 cups	9 DOZEN 6 cups
Lentils (green or golden), dry	1/2 cup	1 cup	2 cups
Water	2 cups	3 cups	6 cups

Directions:

Lentil Puree

Place the lentils and water in a saucepan. Bring to a boil. Cover and reduce heat to low. Cook until the lentils are tender, about 40 minutes. Drain (reserve a little cooking liquid) and puree lentils in a food processor until smooth. Add a little cooking liquid if the lentils seem too dry. The puree will keep in the refrigerator for 3-4 days and can be frozen for a later use.

Cookies

Preheat oven to 350ºF.

In a medium bowl, combine the oats, flour, baking soda, baking powder, and salt.

In a mixing bowl, cream together the butter and sugar. Add the eggs, vanilla, and lentil puree. Mix well to combine. Add the flour mixture and mix well to combine. Fold in the chocolate chips.

Drop by rounded tablespoons onto a cookie sheet. Bake for 10-15 minutes until lightly golden brown.

Nutrition Info:
Per serving (1 cookie)

Calories, 136 kcal
Protein, 3 g
Carbodydrates, 19 g
Total Fat, 7 g
Cholesterol, 18 mg
Saturated Fat, 4 g
Dietary Fiber, 2 g
Sugars, 11 g
Sodium, 59 mg
Folate, 17 µg
Potassium, 92 mg
Vitamin A, 133 IU

Gluten Free Apple Cinnamon Muffins

Serving Size: 1 muffin

Cooking Time 25 min; Total time: 40 min

INGREDIENTS	2 DOZEN	4 DOZEN	8 DOZEN
Brown rice flour	1 cup	2 cups	4 cups
Lentil flour, dry (page 28)	1 cup	2 cups	4 cups
Tapioca starch	1/2 cup	1 cup	2 cups
Cornstarch	1/2 cup	1 cup	2 cups
Baking powder	4 teaspoons	2 tablespoons + 2 teaspoons	5 tablespoons + 1 teaspoon
Baking soda	1 teaspoon	2 teaspoons	4 teaspoons
Xanthan gum	1 teaspoon	2 teaspoons	4 teaspoons
Salt	1 teaspoon	2 teaspoons	4 teaspoons
Cinnamon, ground	1 teaspoon	2 teaspoons	4 teaspoons
Unsalted butter, at room termperature	1 cup (8 ounces)	2 cups (16 ounces)	4 cups (32 ounces)
Sugar	1 1/3 cups	2 2/3 cups	5 1/4 cups
Honey	1/4 cup	1/2 cup	1 cup
Eggs, large	4 each	8 each	16 each
Milk (any variety)	1/2 cup	1 cup	2 cups
Apple, shredded with skin on	2 each	4 each	8 each

Directions:

Preheat oven to 375°F. Line muffin tin with cupcake paper liners.

In a bowl, combine the dry ingredients together: brown rice flour, lentil flour, tapioca starch, cornstarch, baking powder, baking soda, xanthan gum, salt, and cinnamon. Set aside.

In a mixing bowl, cream together the sugar and butter. Add the honey, eggs, and milk. Mix well to combine. Add the dry ingredients to the wet and mix until just combined (do not overmix the batter). Stir in the shredded apple.

Fill the muffin cups. Bake for 20-25 minutes or until a toothpick inserted in the center of the muffin comes out clean. Cool for 5 minutes before removing. Cool completely on a wire rack.

Nutrition Info:
Per serving (1 muffin)

Calories, 217 kcal
Protein, 9 g
Carbodydrates, 32 g
Total Fat, 9 g
Cholesterol, 52 mg
Saturated Fat, 5 g
Dietary Fiber, 3 g
Sugars, 16 g
Sodium, 215 mg
Potassium, 215 mg
Vitamin A, 6%

Zucchini Bread

Serving Size: 1/2 inch slice

Cooking Time 1 1/2 hr; Total time: 2 hr

INGREDIENTS	36 SERVINGS 2 9x5 loaves, 18 1/2-inch slices per loaf	72 SERVINGS 4 9x5 loaves, 18 1/2-inch slices per loaf	108 SERVINGS 6 9x5 loaves, 18 1/2-inch slices per loaf
Whole wheat flour	3 cups	6 cups	9 cups
Baking soda	2 teaspoons	1 tablespoon + 1 teaspoon	2 tablespoons
Salt	1 teaspoon	2 teaspoons	3 teaspoons
Baking powder	1/2 teaspoon	1 teaspoon	1 1/2 teaspoons
Cinnamon, ground	1 teaspoon	2 teaspoons	3 teaspoons
Canola oil	1 cup	2 cups	3 cups
Sugar	2 cups	4 cups	6 cups
Egg, large	4 each	8 each	12 each
Zucchini, grated	2 cups	4 cups	6 cups
Lentil puree*	2 cups	4 cups	6 cups
Walnuts, chopped	3/4 cup	1 1/2 cups	2 1/4 cups

INGREDIENTS: Lentil Puree*	36 SERVINGS 2 cups	72 SERVINGS 3 cups	108 SERVINGS 6 cups
Green lentils, dry	3/4 cups	1 1/2 cups	2 cups
Water	3 cups	4 cups	6 cups

Directions:

Lentil Puree

Place the lentils and water in a saucepan. Bring to a boil. Cover and reduce heat to low. Cook until the lentils are tender, about 40 minutes. Drain (reserve a little cooking liquid) and puree lentils in a food processor until smooth. Add a little cooking liquid if the lentils seem too dry. The puree will keep in the refrigerator for 3-4 days and can be frozen for a later use.

Zucchini Bread

Preheat oven to 350ºF. Grease the 9x 5 loaf pans. Set aside.

In a bowl, whisk together the flour, baking soda, salt, baking powder, and cinnamon. Set aside.

In a large mixing bowl, stir together the oil and sugar. Add zucchini, eggs, and lentil puree. Mix well. Add the dry ingredients. Combine well. Fold in the nuts. Pour batter into the loaf pans.

Bake for 60-70 minutes. Test for doneness with a toothpick inserted into the center of the bread (should come out clean). Cool for 10 minutes in the pan. Remove from the pans and cool on a wire rack before slicing.

Cool completely and store in plastic bag or airtight container.

Nutrition Info:
Per serving (1/2-in slice)

Calories, 158 kcal
Protein, 3 g
Carbodydrates, 21 g
Total Fat, 8 g
Cholesterol, 22 mg
Saturated Fat, 1 g
Dietary Fiber, 2 g
Sugars, 12 g
Sodium, 163 mg
Folate, 28 µg
Potassium, 107 mg
Vitamin A, 51 IU

Dinner Rolls

Serving Size: 1 roll

Cooking Time 1 1/2 hr; Total time: 3 hr

INGREDIENTS	45 ROLLS	90 ROLLS	180 ROLLS
Instant yeast	1/2 ounce (5 teaspoons)	1 ounce	2 ounces
Warm water	1 1/3 cups	2 2/3 cups	5 1/3 cups
Sugar	2/3 cup	1 1/3 cups	2 2/3 cups
Eggs, large	2 each	4 each	8 each
Lentil puree*	1 cup	2 cups	4 cups
White whole wheat flour	3 cups	6 cups	12 cups
AP flour	3 cups	6 cups	12 cups
Salt	2 1/2 teaspoons	1 1/2 tablespoons	3 tablespoons

INGREDIENTS: Lentil Puree*	45 ROLLS	90 ROLLS	180 ROLLS
Yellow/Gold lentils, dry	3/4 cups	1 1/2 cups	2 cups
Water	3 cups	4 cups	6 cups

Directions:

Lentil Puree

Place the lentils and water in a saucepan. Bring to a boil. Cover and reduce heat to low. Cook until the lentils are tender, about 40 minutes. Drain and puree lentils in a food processor until smooth. Add a little cooking liquid if the lentils seem too dry. The puree will keep in the refrigerator for 3-4 days and can be frozen for a later use.

Dinner Rolls

In a bowl, cream together the sugar and butter. Add the eggs, yeast, water, and lentil puree. Mix well. Add all of the white whole wheat flour, 2 cups of the AP flour, and all of the salt. Mix well to make a dough; add enough of the remaining AP flour to make a soft dough. Place the dough in a lightly greased bowl. Cover and let the dough rise in a warm spot for 1 hour.

Lightly grease pie plates or baking sheets with butter. Set aside.

Punch down the dough and divide the dough into quarters. If making 45 rolls, divide the dough into 4 quarters. Cut each quarter of dough into 9 portions and roll each into balls. Place in greased pie plates (each 9-inch plate will hold 9 rolls) or greased baking sheets. Cover and rise for 30 minutes.

Preheat oven to 375ºF. Bake for 20-25 minutes or until golden brown.

Nutrition Info:
Per serving (1 roll)

Calories, 111 kcal
Protein, 4 g
Carbodydrates, 18 g
Total Fat, 3 g
Cholesterol, 15 mg
Saturated Fat, 2 g
Dietary Fiber, 2 g
Sugars, 3 g
Sodium, 151 mg
Potassium, 91 mg
Vitamin A, 2%

Lentil Energy Bars

Serving Size: 1 bar

Cooking Time 45 min; Total time: 1 1/4 hr

INGREDIENTS	36 SERVINGS 2 9x13 pans; 18 bars/ pan	72 SERVINGS 4 9x13 pans; 18 bars/ pan	108 SERVINGS 6 9x13 pans; 18 bars/ pan
Dried dates	1 cup	2 cups	3 cups
Almonds, whole or slivered	1 cup	2 cups	3 cups
Rolled oats	1 cup	2 cups	3 cups
Sugar, raw or granulated	1/4 cup	1/2 cup	3/4 cup
Flax seeds, ground	1 cup	2 cups	3 cups
Lentil flour^	1 1/2 cups	3 cups	4 1/2 cups
Dried cherries or cranberries	1/2 cup	1 cup	1 1/2 cups
Dried blueberries, currants, or raisins	1/2 cup	1 cup	1 1/2 cups
Cinnamon, ground	2 teaspoons	1 tablespoon + 1 teaspoon	2 tablespoons
Lentil puree*	2 cups	4 cups	6 cups
Honey	1 cup	2 cups	3 cups
Almond butter	1 1/2 cups	3 cups	4 1/2 cups
Salt	1 teaspoon	2 teaspoons	1 tablespoon

INGREDIENTS: Lentil Puree*	36 SERVINGS 2 cups	72 SERVINGS 3 cups	108 SERVINGS 6 cups
Golden lentils, dry	1 1/4 cups	2 1/2 cups	3 3/4 cups
Water	2 cups	4 cups	8 cups

^Lentil flour: grind green lentils (or any lentils) in a coffee grinder until powdery. See pages 28 for more information about lentil flour.

Directions:

Lentil Puree
In a small pot, combine the lentils and water. Bring to a boil. Reduce heat to low; cover and cook for 25-30 minutes or until the lentils are soft and tender. Drain well. Puree the lentils in a food processor until smooth. Allow the mixture to cool to room temperature before using in the recipe.

Energy Bars
Preheat oven to 350ºF. Lightly grease a 9x13 baking pan.

In a food processor (lightly grease the blades with vegetable cooking spray), combine the almonds, and dates until finely chopped. Pour mixture into a large bowl. Add the oats, sugar, ground flax, lentil flour, dried cherries, dried blueberries, and cinnamon. Mix well. In a small bowl, combine the lentil puree, honey, and almond butter. Add mixture, along with the salt to the dry ingredients. Stir to combine and moisten the mixture. Spread into the baking pan. Bake for 20 minutes. Cut into squares. Keep the bars wrapped at room temperature for 1-2 weeks.

Nutrition Info:
Per serving (1 bar)

Calories, 201 kcal
Protein, 6 g
Carbodydrates, 27 g
Total Fat, 9 g
Cholesterol, 0 mg
Saturated Fat, 1 g
Dietary Fiber, 4 g
Sugars, 16 g
Sodium, 51 mg
Folate, 52 µg
Potassium, 270 mg
Vitamin A, 7 IU

Can lentils compete with processed energy bars? Short answer: Yes!
A natural superfood, lentils are packed with protein, fiber, folate, and iron. These lentil energy bars are comparable to Power Bars and Clif Bars. The nutrient breakdown is below in Table 16. By making your own lentil energy bars, you can take control of the ingredients by adding less sugar and tailoring the ingredients to individual tastes. As with any energy bar, the Lentil Energy Bars are great for traveling, hiking, and exercising.

Table 16: Lentil Bar Comparison

Nutrient	Lentil Bar (55g)	Power Bar, Chocolate (60g)	Clif Bar, Chocolate Chip (68g)
Calories	215	240	240
Total fat (g)	9	3	5
Sat. fat (g)	1	1	1.5
Cholesterol (mg)	0	0	0
Sodium (mg)	69	200	150
Carbohydrate (g)	27	45	44
Fiber (g)	8	3	7
Sugar (g)	13	25	23
Protein (g)	8	8	10

Gluten Free Sandwich Bread

Serving Size: 1/2 inch slice

Cooking Time 45 min; Total time: 1 1/2 hr

INGREDIENTS	36 SERVINGS 2 9x5 loaves, 18 1/2-inch slices per loaf	72 SERVINGS 4 9x5 loaves, 18 1/2-inch slices per loaf	144 SERVINGS 8 9x5 loaves, 18 1/2-inch slices per loaf
Brown rice flour	3 cups	6 cups	12 cups
Cornstarch	2 cups	4 cups	8 cups
Tapioca starch	2 cups	4 cups	8 cups
Buttermilk powder	1/2 cup	1 cup	2 cups
Xanthan gum	4 teaspoons	2 1/2 tablespoons	5 tablespoons
Salt	2 teaspoons	4 teaspoons	2 1/2 tablespoons
Instant yeast	1 ounce	2 ounces	4 ounces
Lentil flour, wet (page 28)	2 cups	4 cups	8 cups
Eggs, large	6 each	12 each	24 each
Cider vinegar	2 teaspoons	4 teaspoons	5 tablespoons
Canola oil	1 cup	2 cups	4 cups
Honey	2 tablespoons	1/4 cup	1/4 cup
Warm water	2 2/3 cups	5 1/4 cups	10 1/2 cups

Directions:

Preheat the oven to 400ºF. Grease the 9x5 inch loaf pans.

Mix together the dry ingredients: cornstarch, tapioca starch, brown rice flour, buttermilk powder, xanthan gum, salt, and yeast. Set aside.

In another bowl, mix together the wet ingredients: lentil flour, eggs, cider vinegar, canola oil, honey, and water. Add the dry ingredients. Mix well to combine. The bread "dough" will resemble more of a batter.

Cover with plastic wrap and let it sit at room temperature for 30 minutes.

Pour batter into the greased loaf pan(s). Bake for 30-45 minutes or until the internal temperature of the bread reaches 200ºF.

Remove from the pan and cool on a wire rack

Nutrition Info:
Per serving (1/2-in slice)

Calories, 222 kcal
Protein, 6 g
Carbodydrates, 33 g
Total Fat, 8 g
Cholesterol, 32 mg
Saturated Fat, 1 g
Dietary Fiber, 4 g
Sugars, 3 g
Sodium, 151 mg
Potassium, 202 mg
Vitamin A, 1%

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RESOURCES

For more information about lentils and other legumes, please visit the following websites:

The World's Healthiest Foods: Lentils
http://whfoods.com/genpage.php?tname=foodspice&dbid=52

Pulse Canada
http://www.pulsecanada.com/

USA Dry Pea and Lentil Council
http://www.pea-lentil.com/

Northern Pulse Growers Association
http://www.northernpulse.com/

Timeless Seeds, Inc.
https://www.timelessfood.com

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Green Lentil Sprouts:
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