

Market Intelligence Fact Sheet (Format for results of RMA)

Gegharkunik Marz

Second selected crop

Botanical name of the crop - Lens culinaris

English name -Lentil

Local (Armenian) name—Vosp(Ոսպ)

Photo 1 (full plant/tree)



Photo2 (harvested fruits)



Photo 3 (processed product A)



Photo 4 (processed product B)



1. Historical origin and cultivation history in project sites

Lentils are legumes along with other types of beans. They grow in pods that contain either one or two lentil seeds that are round, oval or heart-shaped disks and are sometimes smaller than the tip of a pencil eraser. The lowly lentil has been sustaining man for thousands of years.

Lentils are very nutritious, filling, and more importantly, arguable the most flavorful of all the legumes.

Lentils were among the earliest food crops cultivated by Neolithic man. *L. Orientalis* is thought to be the wild progenitor of cultivated *L. culinaris*. Its domestication occurred in the eastern Mediterranean region now occupied by northern Israel, Syria, southern Turkey, northern Iraq and western Iran. Therefore, we can conclude that lentil was also the earliest food crops cultivated in Armenia. From this region lentil cultivation spread to Europe, India, China and Ethiopia. Lentils are now an important source of protein in the diet of millions of people in the Mediterranean area, Africa, the Middle East, southern Asia and South America.

2. Conservation status now

There are a range of wild lentils but *L. Orientalis* is believed to be the progenitor of the cultivated lentil.

There are three varieties of lentil that grows in Armenia

- ✓ *Lens ervoides*
- ✓ *Lens Orientalis*
- ✓ *Lens culinaris*

First two are wild relatives of *Lens culinaris* and grows in Syunik, VayotsDzor, Ararat regions of Armenia. They are registered in the Red Book of Armenia. Edible lentil can be cultivated in almost all regions including Gegharkunik region.

There are four main categories of lentils: brown, green, red/yellow, and specialty. Despite the fact that can find red, yellow and brown lentil in the stores, green lentil is the most popular to cultivate and use.

GREEN LENTILS

Green lentils are extremely similar to brown lentils, but they have a more robust and slightly peppery flavor and come in a range of sizes. Green lentils can vary in color from a pale or spotted green to a green-slate color with hints of blue and black.

There are three variety of lentil growing in Armenia – 1. Talini 6, Local Ashtarak and Armenian 88.

Currently, eight farmers are engaged in growing lentils in Gegharkunik region. 4 hectares of land were cultivated last year.

RED LENTILS

Red lentil colors can range from yellow/gold to bright orange or red. They have a slightly sweeter taste and tend to lose their shape and breakdown to a puree consistency while cooking. For this reason, they're ideal for soups, Indian dal, or in curries, where these types of lentils have been used as the primary ingredient for centuries. Because they do not have a protective coat, they take a shorter time to cook.

4.3. Nutritional values and unique traits

Lentils contain the highest amount of protein originating from any plant. The amount of protein found in lentils is up to 35%, which is comparable to red meat, poultry, fish, and dairy products. Lentils contain carbohydrates (15-25 grams per 100 grams). They are a good source of dietary fiber and also have a low amount of calories. Other nutritious components found are molybdenum, folate, tryptophan, manganese, iron, phosphorous, copper, vitamin B1, C and potassium.

Lentils are also another source of phytochemicals and phenols. Both of these organic chemicals are known to provide health benefits, but the mechanism behind their work is yet to be determined. Often, lentils and meat are compared for their effectiveness and many people vote for meat as the best source of protein. It is true that lentils do not contain all the amino acids, but they do have less fat content when compared with meat.

Whole green lentils

Nutrition Facts	
Serving size	½ cup (125 ml) Cooked
Amount per serving	
Calories 230	Calories from Fat 6
	% Daily Value *
Total Fat 1g	1%
Saturated Fat 0g	1%

Trans Fat	
Cholesterol 0mg	0%
Sodium 4mg	0%
Total Carbohydrate 40g	13%
Dietary Fiber 16g	63%
Sugars 4g	
Protein 18g	
Vitamin A – 0%	Vitamin C – 5%
Calcium - 4%	Iron – 37%

*Percent DAILY value are based on 2000 calories diet.

Lentils, cultivated ever since the advent of early agriculture, have been a part of our diet for quite long now. They provide multiple health benefits, including the following:

Muscle generation

Our organs and muscles need a constant supply of protein for repair and growth of the body. Lentils contain all the essential amino acids that are needed by our body for good muscle-building and smooth functioning of the body.

Control diabetes

A study showed that in the various categories of foods, dietary fiber was found to be high in case of the legume family. Lentils, along with beans and peas, belong to the legume family. Dietary fiber filled food such as lentils help in controlling blood sugar levels. Dietary fiber also slows down the rate at which food is absorbed by the blood and thus maintains the sugar level constantly.

Improve digestion

As lentils contain high levels of dietary fiber, it improves digestion if consumed regularly. It also helps in easy bowel movement, resulting in decreased constipation.

Heart health

Lentils, with their negligible amounts of fat, are an ideal source of protein without adding any extra fat to the body, thereby promoting a healthy heart. Lentils contain magnesium, which helps in relaxing cardiovascular muscles and help lower blood pressure.

Prevent atherosclerosis

Research showed that the consumption of lentils provides a supply of antioxidants that decreased the chances of developing atherosclerosis. Also, these antioxidants play a role in neutralizing free radicals and thereby preventing cell and gene damage.

Good source of folic acid

Lentils are a good source of vitamin B-complex, such as folate or folic acid. The consumption of folic acid by pregnant women helps in preventing birth defects. According to a study a lack of folic acid often results in neural tube defects. Folate found in lentils helps in the formation of red blood cells, is good for pregnant women, and plays a key role in maintaining homocysteine levels. It is also known to be effective against hypertension and DNA damage, which may result in cancer.

Weight management

Research studies suggest that the regular consumption of lentils can help in weight control and increase satiety.

Healthy nervous system

It was proved that vitamins and minerals found in lentils are helpful for optimum brain functioning.

High iron content

Lentils contain a high amount of iron, which is needed by the body for optimum hemoglobin production. About 36% of the iron of the Daily Recommended value can come from eating 1 cup (200 grams) of lentils every day.

Boosts metabolism

Lentils are a good source of many vitamins, including vitamin B3, which plays a significant role in boosting the digestive and nervous systems. Vitamin B3 offers many other benefits, including cholesterol control, a decreased risk of diseases like Alzheimer's, cataracts, osteoarthritis, and diabetes.

5.4. Uses and derived products

The crop has a high significance in cereal-based systems because of its nitrogen fixing ability, its high protein seeds for human diet and its straw for animal feed. It is widely used in a range of dishes and reputed to have many uses in Armenian traditional cuisine.

Lentil is the most desired legume in many lentil-producing regions because of its high average protein content and fast cooking characteristics. It can be used as a starter, main dish, side dish or in salads. Seeds can be fried and seasoned for consumption as snacks. Flour is used to make soups, stews and purees, and mixed with cereals to make bread and cakes,

and as a food for infants. Young, green, fresh lentil pods are eaten raw or steamed like green peas, while lentil sprouts are added to salads, soups, breads and savoury dishes.

Lentils which fail to meet food grade standards can be used as livestock feed because of their high protein content and lack of digestive inhibitors.

Lentil flour

Due to development of small bakeries the use of composite flour in bread making has received some attention in the past few years. The addition of legume flours improves the nutritional value of bread not only because of its higher protein content but also because of its higher lysine content compared with wheat flour. Taking into consideration the fact that Armenians use bakery products in daily life every often flour prepared from a range of legumes including lentils could be successfully incorporated into bread.

6.5. Agricultural production

Lentil is adapted to cool growing conditions, and the young plants are tolerant of spring frosts. This allows for early spring planting dates. High humidity and excessive rainfall during the season encourages vegetative growth, which prevents good yield and can reduce seed quality. About 250-300mm annual rainfall will produce high yields of good quality seed. Excessive drought and/or high temperatures during the flowering and pod-fill period also reduce yields.

It is very hardy and can tolerate frost and severe winter to a great extent like the weather in Gegharkunik region. Lentil can be grown with the moisture conserved in the soil during the rainy season. It requires cold temperature during its vegetative growth and warm temperature at the time of maturity. The optimum temperature for growth is 18-30°C.

Lentil soil requirements is also suitable for growing it in Gegharkunik region because it is adapted to all soil types, from sand to clay loam, if there is good internal drainage. Lentil does not tolerate flooded or waterlogged soils, and does best on deep, sandy loam soils high in phosphorus and potassium. Good drainage is required, because even short periods of exposure to waterlogged or flooded field conditions kill plants. A soil pH near 7.0 is best for lentil production.

Yield Potential

Yields vary with variety, management, location and environmental conditions. Under good management and excellent growing conditions, lentil can yield about 70-100 kg/ha to 120-140 kg/ha (average yield regarding to growing lentils in Armenia). For comparison, in

Canada yield ranges from 400-700 kg/ha. Organic cultivation will normally fetch % lower yield.

Harvest

Lentils can be harvested by the combine or manually in small fields. Lentil should be harvested when plants begin to turn yellow and the lower pods become brown to yellow-brown in color. Pods can readily shatter, therefore harvesting should not be done during hot, dry periods of the day. Lentil has a weak stalk and tend to lodge badly. This means that low cut is required in order to minimize losses.

7.6. Demand and consumer interests

Lentil has wider market opportunity domestically with increasing and ever changing client demand. There is also an increasing export demand on organic lentil, which can be met with research and development efforts towards increasing yield, setting up seed supply schemes and improving quality through processing industries in Armenia.

Lentil is grown throughout the world. World lentil production for 2017 was 6,605,000 metric tons, primarily coming from Canada, India and Australia. Canada is the largest export producer of lentils in the world. Armenia imports lentil mainly from Russia and Canada, but has opportunity for organic lentil export. In retail we find that organic lentils fetch a premium price of 15-40% compared with conventional lentils. Retail prices range from AMD 450-1600 per kg with lowest prices for Russian lentils sold in traditional farmer markets in Yerevan and highest prices for imported (Canada) or domestic brands sold per 500 gram packages in supermarkets.

Here are the most popular brands for lentil in stores of Yerevan

1. "Maranik" LTD
2. "Anush lini" LLC
3. "Broccoli" LTD
4. "Alex Grig" LTD
5. "Vesteros" LTD
6. P/E "B. Davtyan"
7. "Agrolog" CJSC



	Brand name	Country	Weight	Price	Comments
1.	"Maranik" LTD 	Canada	0.5 kg	860 AMD	available in 0.5 and 1 kg (1720 AMD)
2.	"Anush lini" LTD 	Armenia	0.5 kg	640 AMD	
3.	"Broccoli" LTD (Lentils "Golden Mill") 	Armenia	0.5 kg	740 AMD	available in 0.5 and 1 kg (1430 AMD)
4.	"Alex Grig" LTD (Lentils "Moya Semya") 	Canada	0.5 kg	520 AMD	




5.	"Vesteros" LTD (Lentils "Krupitsa") 	Armenia	1 kg	1100 AMD	
6.	"Agrolog" CJSC 	Armenia	0.5 kg	950 AMD	Organic Product
7.	P/E "B. Davtyan" 	Armenia	435 g	1100 AMD	Lentil flour
8.		Russia	-	450 AMD	In the market lentil is sold in kilograms and is mainly imported from Russia

After research, we can surely say that green lentil is the most popular. The next is red lentil which is mainly imported and has a relatively high price. What concerns the brown, yellow, and black lentils, they can be found in seldom shops and not always. The prices are incomparable high.

In the market there are both foreign and local firms of red lentil. The latter import raw materials clean and pack it.

But the yellow, brown, and black types of lentils are imported in a very limited amount.

	Brand name	Country	Weight	Price	Comment
1.	Red "Maranik" LTD 	Canada	500 g	1050-1130 AMD	
2.	Red "Raffael Contini Trading Company" JV LTD 	Canada	450 g	750-880 AMD	
3.	Red "YUGOPTTORG" LTD 	Russia	800 g	730 AMD	

4.	Yellow "Mistral Trading" LTD 	Russia	450 g	1800 AMD	
5.	Black "Davert" 	Germany	500 g	3480 AMD	Organic product available only in "Dreen Day" organic store
6.	Brown "Davert" 	Germany	500 g	3480 AMD	Organic product available only in "Dreen Day" organic store

Type and size of packaging

Lentil in the markets is sold both in kilograms and in transparent packages. Lentil in transparent packages usually has one or half kilogram weight.

7. Value Chain Map and Supply Analysis

Some of the value chain studies suggest that compared to cereals, the pulse market structure is less organized, market chains are less visible, and the market has a

seasonal nature that changes from time to time, depending on the production level in the area.

Overall, the lentil value chain in Armenia involves input suppliers, small-scale producers, assemblers, rural based wholesalers, urban wholesalers, rural and urban retailers, processors, consumers, importers and exporters. Small farmers dominate the supply market, and sell their lentils either to small-urban and rural consumers, or to local assemblers or wholesalers.

