# **Exporting mulberry fruits and leaves to Europe**

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Mulberries are seen as superfoods on the European market. Demand for the dried fruits is increasing. Fruits, leaves and their extracts have potential in the market for food supplements, because of their high level of antioxidant activity and chemical composition. You will need to develop a strong story to market mulberries as ingredients for health products, to exploit their full potential. You may need to promote the potential health benefits among health product manufacturers and consumers.

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# **1. Product description**

Mulberries are trees in the *Morus* genus. The dried fruits of various *Morus* species are increasingly sold on the European market under the name mulberries. Mulberries are cultivated and grow in the wild across warm, temperate regions in Southern Europe, the Middle East, Northern Africa, the Indian subcontinent, East Asia and the Americas. Supplies for the European market mainly come from cultivated sources.

Mulberry fruits, leaves, roots and their extracts are used in:

- Food: large market for dried mulberry fruits as ingredient for snacks or bakery ingredient
- Health: mainly as leaves or leaf extract, limited use of mulberry fruit extracts
- Cosmetics: small market, mainly as leaf, root and fruit extracts in skin care products

Although the (root) bark and twigs are also used in Traditional Chinese Medicine (TCM), they are less common in Europe. Roots and twigs have been reported to have a high level of antioxidant activities and anti-inflammatory properties.

You need to determine the exact source (species) of your mulberries. The only two species that are allowed on the European market for health products are:

- white mulberries (Morus alba), which is the main species sold on the European health market
- black mulberries (*Morus nigra*)

This study focuses on these two species of mulberries. It discusses opportunities for both mulberry fruits and mulberry leaves and their extracts.

Mulberry fruits and leaves are marketed as 'superfoods' on the European market. This is because of their high level of antioxidant activity and their vitamin and mineral content (see Table 1). Of the two species, black mulberry leaves (*M. nigra*) have a higher level of antioxidant activity than white mulberry leaves (*M. alba*).

In European health products, mulberry fruits and leaves are marketed for immune support. This is based on their composition and level of antioxidant activity.

Table 1: Composition of mulberry fruits and leaves

	Chemical components of relevance for health sector
Fruits	Vitamins: C Minerals: Potassium, Calcium, Natrium, Magnesium Fibre Relatively low in sugar Resveratrol (claimed to have beneficial effect on vascular health)
Leaves	Vitamins: C, A Minerals: Iron, Zinc, Calcium Protein Fibre

A lot of research has been done on the level of antioxidant activity in mulberry leaf and fruit extracts and the related health benefits. These studies report a high level of activity for these extracts, based on different components.

Mulberry leaves are also marketed for weight management and to balance blood sugar levels. This is based on their use in Traditional Chinese Medicine (TCM).

On the European health products market, mulberry fruits and leaves can only be used in food supplements. Table 2 below gives an overview and classification for white and black mulberries.

Table 2: Use and classification of mulberry leaves and fruits in health products

White m	ulberries ( <i>Morus alba</i> )	Black mulberries ( <i>Morus nigra</i> )
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Food supplements	The fruits and leaves are allowed in food supplements. They are listed on BELFRIT and German national positive lists. The stem and root bark are also listed on the Italian and Belgian national positive lists. The root is also listed on the French and Italian national positive lists.	The fruits and leaves are allowed in food supplements. They are listed on BELFRIT and German national positive lists. The bud and stem bark are also listed on the BELFRIT list and on Italian and French national positive lists. The stem is also listed on the Belgian national positive list. The root bark is also listed on the Italian, French and Belgian national positive lists.
Herbal medicinal products	In Europe, mulberry fruits and leaves are not allowed in herbal medicinal products.	
Chemical Administration Service number	94167-05-2	90064-11-2
European Community Number	Extracts: 303-403-2 Bark extract: 928-698-0 Fruit extract: 922-867-2 Leaf extract: 921-920-7	Extracts: 290-072-1
Harmonised System code for trade in mulberries:	0813.4095: 'Other dried fruit' The extracts of mulberry fruits and leaves are traded under: 1302.19: 'other vegetable saps and extracts'	

#### Source: European Chemicals Agency

In Europe, the fruits and leaves of black and white mulberries are only allowed in food supplements (Table 1). Mulberries are commonly sold as:

• Dried fruit, where they are more often sold as food product than as food supplement

- Leaf powder
- Mulberry leaf tea
- Capsules containing mulberry leaf extract or fruit extract (less common)

The bud and stem bark of black mulberries are also allowed in food supplements in the BELFRIT countries (Belgium, France and Italy). Based on the BELFRIT positives list, health authorities in other countries might allow use of these products.

Moreover, different national positive lists include other products:

- Belgium: stem and root bark of both white and black mulberries.
- France: stem and root of white mulberries and root bark of black mulberries.
- Italy: root bark, fruit and leaves of *Morus* spp., thus including white mulberries.

The national Italian positive list for food supplement ingredients includes several properties and effects of mulberries. These include:

- Digestive health
- Vascular health (maintaining healthy blood pressure)
- Joint health
- Antioxidant
- Detox
- Urinary tract health
- Respiratory health

Of these properties and effects, mulberry fruits and leaves are most commonly marketed for their high level of antioxidant activity. Based on this, they are advertised as a superfood and to support the immune system.

Producers of food supplements can't make medicinal claims. Examples of claims used in Europe for products containing mulberry leaves and fruits are listed in the table below.

Table 3: Claims used in Europe on mulberry leaf and fruits products

Mulberry leaves	Mulberry fruits	
<ul> <li>"Used in TCM (Traditional Chinese Medicine) for blood sugar &amp; cardio support."</li> <li>"is packed with vitamins and minerals."</li> <li>"helps in strengthening your immune system."</li> <li>"Blood Sugar Support"</li> </ul>	<ul> <li>"Mulberries are a great source of vitamin C."</li> <li>"Rich in vitamins C and K, iron, calcium and fibre."</li> <li>"Mulberries are noted for their nutrient content, bursting with vitamins and minerals."</li> <li>"In traditional Chinese Medicine mulberries are used to support liver and kidneys."</li> </ul>	

## Tip:

• Don't make medicinal claims for your mulberry products, as they are not allowed in herbal medicinal products.

# 2. What makes Europe an interesting market for mulberries?

## Growing European demand for mulberry products

Although demand for mulberry leaves and extracts is strongest in Asia and the United States, there is a small and growing market in Western Europe, mainly in France and Germany.

According to industry sources, mulberry fruits are very popular on the European market and demand is growing. Currently, the fruits are still mainly marketed as food (dried fruits).

Mulberry products are now mostly used for immune support, blood sugar and weight management (see trends below). Their popularity has also led to research in other areas. For example, on the potential of root bark to aid arthritis or the anti-diabetic effects of the leaves.

## Tip:

• Support claims with data from trustworthy sources such as through scientific resources, for example through Elsevier Science Direct (not for free), Google Scholar or Examine.com.

## Strong demand for mulberries because of a changing perception of health

A changing understanding among consumers of what it means to be healthy is driving consumption of mulberries. European consumers use health products to prevent diseases and to feel good, for example by adding supplements to their regular diet.

This is translated into a growing market for food supplements. The European food supplements market is expected to grow by 9.5% from 2015 to 2020.

More specifically, there is a growing demand for food supplements that support the immune system. European consumers link the immune system to preventive health. This opens up opportunities for mulberry supplements. The use of mulberries for these health issues is supported by their antioxidant properties and content of vitamins and minerals.

In Europe, supplements that support immune system health are very popular. Their popularity differs depending on the specific European market. For example, in 2013, food supplements that support the immune system had a relatively high market share of total food supplements in several countries:

- France (14%)
- Italy (12%)
- Germany (9%)

Food supplements aimed at general health support are also often related to maintaining a robust immune system. In Western Europe, these have a particularly high market share in:

- Germany (20%)
- United Kingdom (14%)
- Italy (12%)

## **Tips:**

• See our study on superfoods in Europe for more information on the market and trends. Be careful on how to frame the superfood status of mulberries in your marketing materials. The term superfood is not an authorised health claim in Europe. European companies can only use this term on their label if

it is part of the brand name.

- Especially if you sell mulberry fruits, determine if you can add a nutrition claim to your product. These are claims that a food has particular beneficial nutritional properties because of its energy or nutrient content, for example, that the fruits are a source of specific vitamins and minerals.
- Refer to immune support properties of mulberries in your product documentation.

# Rising obesity levels drive demand for weight management and energy products

Weight management is becoming increasingly important to be healthier and prevent illnesses. At the same time, the World Health Organization estimates that 30–70% of the European population is overweight and 10–30% is obese. This opens up opportunities for weight management products, such as mulberry leaves. Based on their potential to balance blood sugar levels, they are marketed as weight management products.

Projections by the World Health Organization indicate that the proportion of obese adults will increase in most European countries by 2030. Countries with a particularly fast increase are included in Figures 1 and 2.

The growing rates of obesity and increasing awareness of the importance of healthy lifestyles is leading to a rising global demand for supplements for weight loss and weight management. This market is expected to grow by 5.3% annually from 2016 to 2020.

Both mulberry fruits and leaves have been studied for their weight-management potential, for example with regard to the potential of blood sugar management for the leaves, or the anti-obesity effects of mulberry fruits.

#### **Tips:**

- Look for credible literature sources on the weight-management benefits of mulberry fruits and leaves, especially in terms of the blood sugar management potential of the leaves. Use these references in your product documentation and marketing materials. However, make sure that you don't make any medicinal claims. These are not allowed for mulberries or weight-management products.
- See our study on anti-obesity food supplements for more information on this market.

#### Interest in organic-certified mulberries

Demand for organically produced food supplements keeps on growing. Industry sources indicate that the market for organic mulberries is growing, especially for the dried fruit. Organic-certified mulberry fruits take up a share of around 10% of the total market. Organic certification can add a lot of credibility when marketing mulberries as a superfood.

- Check if there is sufficient demand for an organic version of your mulberry fruits or leaves. Talk to your (potential) buyers to see if they are interested in certified mulberries. Look for companies that trade in certified mulberries online or at trade fairs. For example, check exhibitors of the organic tradefair Biofach, or search organic importers on the website of the International Trade Centre.
- If your mulberries are not certified, promote the sustainable and ethical aspects of your production process. Buyers might ask you to support your claims with certification or documentation on your sourcing practices and/or your Corporate Social Responsibility (CSR) practices.

• See our study on buyer requirements for natural ingredients for health products for more information on certification standards.

# **3.** What requirements must mulberries comply with to be allowed on the European market?

You can only supply European buyers of mulberries if you comply with buyer requirements for natural ingredients for health products (see below).

Your mulberries need to be sustainably sourced. You need to make sure that you can supply a stable supply of mulberries to your buyers, especially if you are producing mulberry fruits. European buyers indicate that this is a key market entry requirement (see competition below). Supplies need to be sustainable in terms of both quality and quantity.

#### **Requirements specifically for food supplements**

You can only export your mulberries to the European food supplements market if you comply with the legal requirements for natural ingredients for health products. For food supplements, these include:

- European legislation for food supplements (composition and labelling requirements)
- General Food Law
- Food Safety (see below)

#### Food safety requirements cover:

- Maximum Residue Levels (MRLs)
- Contaminants in food and microbiological contamination of food
- Hygiene of Food (Hazard Analysis Critical Control Point)
- Extraction solvents
- Irradiation of food
- Traceability

#### **Additional requirements**

Many buyers have additional quality requirements. These can go beyond legislation and standards. They are established in buyer specifications. Examples are requirements related to:

- Active ingredient content
- Moisture content
- Contaminants
- Residues

To show that you meet the specifications of buyers, you need to develop well-structured company and product information. This includes detailed Technical Data Sheets.

#### **Tips:**

- See our tips for doing business.
- See our manual on preparing a Technical Data Sheet for more information and tips.

## **Requirements for niche markets**

Standards and requirements for social and environmental sustainability include:

- Organic production
- Verification and/or certification of sustainable production, including FairWild, FLO Fairtrade, FairForLife, UNCTAD BioTrade Initiative, Union for Ethical BioTrade
- Supplier codes of conduct
- ISO 26000 on social responsibility

European food industries increasingly demand compliance with quality and food safety management. Examples include:

- ISO 9001:2008 (required for health ingredients)
- International Food Standard
- ISO 22000 (food safety)
- ISO 31000 (risk management)

#### **Tips:**

- Verify with your buyer which of the above standard they require.
- See the Standards Map for additional information on voluntary standards.

## **Quality requirements for mulberries**

The use of mulberry fruits and leaves is based on their composition and level of antioxidant activities. The main quality requirements of European buyers on these two aspects are laid down in their specifications. You need to show what the composition and level of antioxidant activities is to determine if this complies with your buyer's specification.

Various studies have been done on the chemical composition and activities of mulberry fruits and leaves, which you can use as a reference.

Antioxidant activity can be estimated with an extract's content of phenols and flavonoids. These are two types of compounds that have been shown to be indicators of the specific level of antioxidant activity of a product. If they are high, level of antioxidant activity is expected to be high as well.

You also need to make sure that you can offer a consistent quality of your mulberry products.

- Work together with a local university to test your mulberries. They can help determine their chemical composition, which needs to be included in your product documentation.
- Standardise and minimise significant variations in your product's quality. Monitor harvest and postharvest practices and minimise time between harvest and processing. Develop standard operating procedures and train farm and processing staff, in particular if you work with smallholders who supply you with raw materials. Use incentives to ensure that they follow your specifications on harvesting and post-harvest processes.
- Always match activities such as standardisation to the requirements of your buyer.
- Keep your facilities, storage rooms and equipment clean.
- Don't adulterate your product. Such practices hurt your reputation. Importers regularly analyse products for adulteration.

## Labelling requirements

To get your mulberries onto the European market you must comply with the following labelling requirements:

- Set up a registration system for individual batches of your mulberry products, whether they are blends or not, for example, if you blend products from different harvests. Mark them accordingly to ensure traceability.
- Label your products in English, unless your buyer wants you to use a different language.

Your labels must include:

- Product name/INCI name
- Batch code
- Place of origin
- Name and address of exporter
- Date of manufacture
- Best before date
- Net weight
- Recommended storage conditions

If you supply organic mulberries, your label needs to include the name/code of the inspection body and certification number.

You also need to give your buyer the following documentation:

- Technical Data Sheet (TDS) (see this example for acai berry extract)
- CAS number
- Certificates of Analysis (check this example of mulberry root extract)
- Safety Data Sheet (SDS) (see this example of mulberry fruit extract)
- GMO certificate (if requested)
- Certificate of Origin
- Product information sheet

Mulberry extracts are not classified as hazardous. You do not need to add hazard symbols or risk/safety phrases.

## Packaging requirements for bulk packaging

Packaging requirement may differ per buyer and specific product. However, there are some general requirements you have to take into account which are included in standards. See the tips below.

## **Tips:**

- Always ask your buyer for their specific packaging requirements.
- Re-use or recycle packaging materials. For example, use containers of recyclable material (e.g. metal).
- Use containers of a material that does not react with components of the extract (e.g. lacquered or lined steel, stainless steel, aluminium).
- Clean and dry the containers before filling them with mulberry extracts.
- Store containers in a dry, cool place to prevent quality deterioration.
- If you offer organic-certified mulberries, physically separate them from mulberries that are not certified.

## 4. What competition do you face on the European market for

## mulberries?

## **Market entry barriers**

Market entry barriers depend on the level of processing you do.

If you produce dried mulberry fruits, market entry barriers are relatively low. You can also expect more new entrants at this level.

Industry sources indicate that the main issue with dried mulberry fruits is the continuity of supplies. Therefore, access to raw materials (in case of wild mulberries), scale of production and processing is important to enter this market.

Market entry barriers increase if you produce mulberry fruit or leaf extracts for food supplements. You need more advanced technology, skilled personnel to work with this technology and you need to manage quality. European buyers may expect a much higher quality than quality requirements in your home country.

Part of this is that you will also need to develop marketing materials to enter the market for food supplements with your extract. Industry sources see a potential for mulberries here, but because mulberry products are less common than other superfoods some buyers will need to be educated on their benefits. However, although mulberry fruits are increasingly well known as a dried product on the European market, there are fewer food supplements containing mulberry fruits or leaves on the market.

This also means that the threat of new entrants for food supplements or final products is substantially lower than if you export dried fruits.

If you want to produce final products such as mulberry leaf powder or leaf tea, market entry barriers are higher. You need to include costs for product development, market authorisation and marketing. India is now the main supplier for mulberry leaf final products. According to industry sources, producers in neighbouring countries should also be able to take up this value addition step.

#### **Tips:**

- Do a feasibility study to determine your returns on investment and financial and human resource capacities to produce according to international buyer requirements. Perform this study before you start mulberry cultivation, take steps in terms of further processing of mulberry leaves or fruits into extracts or final products (tea).
- Set aside enough money for marketing if you want to market mulberry leaves or fruits. Obtain market information with desk research and interviews. Develop promotional materials and a website, or social media. This may be expensive, but is essential to promote your product.
- Visit or participate in trade fairs to test if the market is open to your product, get market information and find potential buyers. The most relevant trade fairs in Europe are SANA, Health Ingredients Europe, Biofach (for organic products) and Vitafoods

## What are substitute products for mulberries? Substitute products for mulberries used for immune support

For immune support, synthetic vitamins and minerals are the main substitute for mulberries. These products make up around half of the European food supplement market. It will be difficult to compete with these products on price, as they are much cheaper than mulberry products. However, you can compete with these products by emphasising that mulberry products are a natural source of a wide range of nutrients and have a high level of antioxidant activity.

A wide range of natural products are marketed for immune support and overall wellbeing. These include:

- Plant-derived vitamins or products with plant materials that are high in vitamins
- Pro- and prebiotics, which are often consumed as yoghurt (drinks)
- Fruit-based antioxidants, such as blueberries, elderberries and açai fruits

Commonly used plants for immune support include:

- Echinacea (Echinacea purpurea)
- Ginseng (Panax quinquefolius and P. ginseng)
- Green tea (Camellia sinensis)
- Ginger (*Zingiber officinale*)
- Cat's claw (Uncaria tomentosa)
- Eleuthero (Eleutherococcus senticosus)

Other superfoods are also strong sources of product competition. Products like mulberries that are marketed as superfoods are vulnerable to being replaced by other new or trending superfoods, especially if these also boast a healthy nutritional profile, such as vitamins, or high levels of antioxidant activity. These are often used to improve general health or immune support. Examples include:

- Moringa (Moringa oleifera)
- Baobab fruit powder (*Adansonia digitata*)
- Spirulina (Arthrospira plantensis)
- Turmeric (Curcuma longa)
- Goji berries (*Lycium barbarium*)

#### Substitute products for mulberries used against obesity

Consumers use different types of products for weight management, both natural and synthetic. These include:

- Protein-based products are a strong force of competition. These can be natural or synthetic. They support a feeling of fullness, while they have a low content of carbohydrates and fats.
- Probiotics are strong competitors as well, in particular as they are used for wider digestive health applications.
- Flaxseed oil and other omega-3 oils: These are popular because they also help support the digestive system and healthy cholesterol levels.
- Fruits: Some fruits are used for their laxative properties, for example.

- Do market research into potential substitute products mentioned above to find out how your mulberry leaves and fruits compare in terms of chemical profile, price, supply security/sustainability and ease/costs of substitution. Make sure that you have these results prepared when you talk to potential buyers to answer their questions.
- Diversify your product portfolio to reduce risks. Products marketed as superfoods have a higher risk of being replaced by other superfoods.
- Demonstrate in your communication and promotional materials that you have a good insight into developments among your competitors.
- Build a marketing story for your mulberry products that shows how they are different from competing products. You can focus on the composition of your product or how it is traditionally used to support health.
- Also do a literature study on the potential of mulberries for immune support and weight management and use this in your product documentation and promotion materials.
- See our tips for doing business with European buyers for natural ingredients for health products.
- See our studies on processed fruits such as acai for more information. These are also substitute products for mulberry fruits.

• See our studies on immune support, superfoods and anti-obesity for more information on sources of product competition.

## **Company competition**

The extent and source of company competition depends on the type of mulberry product you supply.

Mulberries can be grown in a wide range of countries in warm temperate regions. If you produce mulberry fruits, you can expect strong competition from:

- Turkey and Iran, the leading producers for mulberry fruits. European buyers indicate that these are the main suppliers to Europe. Due to the growing popularity of mulberry fruits, these countries sometimes struggle to produce sufficient quantities.
- Other countries in the Middle East.
- Asian countries, such as India and Pakistan. White mulberries are native to these countries.
- European countries, such as Spain or Bulgaria. Production in Europe is limited.

European processors are competitors for mulberry fruit extracts. These companies have a competitive advantage, as they know the market and its players very well. Therefore, they can more easily develop an effective marketing campaign.

Mulberry leaves are mainly produced in India and China.

If you produce mulberry leaves, powder or extracts, you can expect most competition from India. This country is the leading supplier of these products, both as ingredient and final products.

China is a very big producer of mulberry leaves, which are used to feed silk worms for silk production. This can give the country a competitive advantage for mulberry products, as these are waste products from silk farms.

- Ensure proper harvest, post-harvest and processing and proper documentation to exploit opportunities to add value to your product. Use this to compete with leading competitors for your mulberry products. Create a Unique Selling Point based on the quality of your products or their marketing story.
- Ensure that you can get an adequate return on your investments for quality improvements and processing. Carry out improvements on quality according to your buyer's specifications. Explore what they are willing to pay for.
- If you decide to produce mulberry leaf or fruit extracts, build trust with your buyers. Ensure traceability of your product and be open about the quality and quantity you can deliver, and at what price. Also ensure that you only use solvents and preservatives according to buyer specifications.
- See our tips for doing business for more information.
- To stand out on the European market, you can also certify your company or products according to social and environmental sustainability standards. Especially organic certification can offer opportunities for mulberry producers. Always verify whether your European buyer is interested in certified ingredients.
- If your buyers are not interested in certified products, you can still help manufacturers build their story by documenting and visualising your product and company's unique value proposition. Final manufacturers with a company image focused on ethical or environmental issues can use this to market the end product in Europe.
- Fair Trade certification can also help to show your buyer that the production of your ingredient is generating rural income and does not harm local communities. This could improve your buyer's

# 5. Through what channels can you get mulberries onto the European market for health products?

Figure 3: Market channels for mulberries for health

#### Source: ProFound

Figure 3 above covers mulberry leaves, as well as mulberry fruit and leaf extracts for the health market. Dried mulberry fruits for the food market are more commonly traded through importers that specialise in dried fruits and nuts. In Europe, these products are often repacked.

Importers and distributors are your most important entry point into the European mulberries market. They may trade in up to 500 natural ingredients, together with other (synthetic) ingredients. They focus on global sourcing, analysis and quality control, rectification, blending, product documentation and sales to processors and end-product manufacturers.

Are you a small exporter and new to the European market? You can also work with an agent to represent you in the market.

Production of mulberry leaf extracts takes place in the United States, Europe or in more developed sourcing countries such as India or China. European and American companies also produce mulberry fruit extracts.

#### Tips:

- Benefit from the experience and knowledge of specialised European importers and agents instead of approaching manufacturers directly.
- To help you enter the market, consider working with an agent or representative with a good reputation. You can look for commercial agents on the website of Internationally United Commercial Agents and Brokers (IUCAB).
- See our study on tips for finding buyers for more information.
- See our study on market channels for dried fruit for more information. This also applies to dried mulberries.

## 6. What are the end-market prices for mulberries?

Compared to similar fruits on the European market (such as bilberries and goji berries) mulberry fruits are relatively inexpensive, according to industry experts. What's more, in the past, there were reports that mulberry fruit extracts were used to adulterate bilberry extracts. Retail prices for dried mulberry fruits on the European market average €20–40 per kg. Organic mulberry fruits are at the top end of this price range.

Mulberry fruit extracts can be priced at up to €50 per kg, for organic-certified fruit extracts, according to industry sources.

Industry sources also indicated that prices for mulberry leaf extracts are lower, up to around €20 per kg.

## **Tips:**

- Ensure that your price reflects the quality levels and delivery conditions.
- Monitor harvests in major production countries, particularly in Turkey and Iran (fruits) or India and China (leaves). This will help you anticipate price developments for your mulberries. You can request such information from importers.

Please review our market information disclaimer.