

Organic food: Helping EU consumers make an informed choice

SUMMARY

Organic production is an overall system of farm management and food production that aims at sustainable agriculture, high-quality products and the use of processes that do not harm the environment, or human, plant or animal health and welfare. Prompted mainly by environmental concerns and in spite of the higher price of organic products, EU consumers spent over €22 billion in 2013, helping the EU organic market grow by nearly 6%. To help them make an informed choice, the European Commission introduced a specific EU organic logo in 2010, complementing earlier legislation setting up an extensive framework of rules and requirements on the production, processing, handling and certification of organic foods. While demand is mainly concentrated in North America and Europe, over three quarters of the nearly 2 million organic producers worldwide are in Asia, Africa, and Latin America.

The EU continues to be a forerunner in organic agriculture thanks to strong consumer demand, strict legal protection and support for organic production. Around one eighth of the world's organic producers – 260 000 – are situated in the EU, and in 2013 they cultivated over 10 million hectares of land. Within the EU organic market Germany has the largest share (€7.6 billion) followed by France (€4.4 billion), the United Kingdom (€2.1 billion), and Italy (€2 billion).

While the sustainable nature of organic farming is generally conceded, its health and nutritional benefits are still widely debated. The use of (organic) pesticides and the possible presence of residues in organically grown crops also attract a lot of attention. Meanwhile, the increasing competition for shoppers and the recent market entry of retail discounters such as Aldi, make analysts fear a price war seriously affecting farmers and food manufacturers. The recent growth in organic farming has also given rise to the so-called 'conventionalisation hypothesis', according to which some big organic farms are increasingly functioning as modified models of conventional farms.



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Background

Eating is vital; therefore choosing (healthy and nutritious) food is part of our daily routine. Food-related decisions are important since their combined [impact](#) globally is expected to be among the most decisive factors for climate change, in terms of water, energy consumption, and land use. This begs the question about the determinants of these choices and whether they are instinctive or rational.¹ Research [shows](#) that the food-related decision-making process is complex and the influences many. Among those are economic determinants (cost, income, and availability); physical determinants (accessibility, education, and skills); social determinants (culture, family, and meal patterns); psychological determinants (mood, stress, and guilt); and personal determinants (attitudes, beliefs, and knowledge about food).

In recent years, in spite of the economic crisis and the fact that organic food is more expensive than conventional ingredients, more and more consumers are taking the option. The European organic market [grew](#) by approximately 6% in 2013, with shoppers spending over €22 billion on organic food. Experts [suggest](#) that consumers anxious about food quality, production techniques and provenance trust organic foods more easily. A public consultation on organic agriculture, [carried out](#) by the European Commission in 2013, drew nearly 45 000 replies from the public and stakeholders. It highlighted the public's concerns with environmental and quality issues, and showed a clear demand for strengthened and more uniform organic rules (86%) and improved control systems (58%).

What is organic food?

One concept many names

The term 'organic' refers to a method of production. [Organic production](#) is an overall system of farm management and food production that aims at sustainable agriculture, high-quality products and the use of processes that do not harm the environment, or human, plant or animal health and welfare. Experts [argue](#) that prior to the development of synthetic nitrogen fertilisers in the early 20th century, all food production in the world was *de facto* organic.

Various terms such as 'bio', 'eco', and 'organic' are used to [refer](#) to organic products.² However, organically grown foods are not to be confused with foods sold as 'natural'. This widely used term in food marketing has a variety of definitions, most of which are vague, and is assumed to imply foods that are minimally processed and all of whose ingredients are natural products.³ The term, 'bio/biological' prevails in Latin and Germanic languages. English-speaking countries mostly use the term 'organic'. In the United States (US), the term 'organic' can be used for certified organic products, while the label 'all-natural' is a legally unregulated expression.

EU definition and standards

The principles governing organic food in the European Union (EU)⁴ are defined in [Regulation](#) No 834/2007 and [Regulation](#) No 889/2008 on organic production and labelling. This method of production pursues the respect of nature's systems and cycles; a high level of biodiversity; responsible use of energy and natural resources – such as water, soil, organic matter and air – and high animal welfare standards (see box overleaf). Additionally, organic plant production is obtained only from organic seeds and based on sustainable cultivation techniques. Fertilisers and pesticides may only be used if they have been authorised for use in organic production. Foods may be labelled as 'organic' if at least 95% of their agricultural ingredients are organic.

Figure 1 – The EU organic logo



Data source: [European Commission](#), 2015.

In non-organic foods, any ingredients which meet organic standards can be listed as organic. Those additives and flavourings which are on the restricted list⁵ of substances authorised in organic production are allowed. The use of food additives of non-organic ingredients is restricted only in case of 'essential technological need or for particular nutritional purposes'.

Organic food is preferably processed with the use of biological, mechanical and physical methods. The use of [ionising radiation](#)⁶ for the treatment of organic food or feed, as well as genetically modified organisms (GMOs) and products produced from or by GMOs (with the exception of veterinary medicinal products) are strictly forbidden during any stage of production, processing or handling (see box).⁷

The EU [Regulation](#) on organic production and labelling specifies that any terms, derivatives or diminutives – such as 'bio' and 'eco' alone or combined – suggesting that a product or its ingredients have been obtained through an organic method of production, may be used in any official EU language for the labelling and advertising of products. The [introduction](#) of an EU logo in 2010 (see figure 1) does not prevent the simultaneous use of [national or private](#)⁸ [logos](#), and aims to create more clarity for EU consumers. However, a 2013 [poll](#) showed that it was recognised by only 25% of Europeans.

Genetically modified organisms

The existing EU labelling thresholds represent ceilings which are linked only to the accidental and technically unavoidable presence of GMOs. The [Regulation](#) on genetically modified food defines a threshold of 0.9%, under which a product's GMO content does not have to be indicated and the product can be labelled as 'organic'. In other words, it is not possible to label a product as organic if it contains 1% of GMOs. However, with increasing GMO use in conventional agriculture and due to the possible risk of transmission of GMOs in the environment (e.g. through pollen), it will become difficult for organic agriculture to ensure that organic products are completely GMO free in the future.

Animal welfare

Animal welfare is an important [requirement](#) in organic livestock production. Farmers must use organic feed, which cannot contain any substances that artificially promote growth, synthetic amino acids or GMOs, in order to market their products as organic and use the EU logo. Hormones or similar substances are only allowed as a veterinary therapeutic treatment in an individual animal. Chemically synthesised medicines including antibiotics may be used under strict conditions and only when the use of phytotherapeutic or homeopathic products is inappropriate. Cloning and or transferring embryos is also forbidden.

There are strict [rules](#) on the way in which animals are housed, in terms of space, air and light. Tethering animals is not allowed unless it is essential for safety, welfare or veterinary reasons. Any suffering is kept to a minimum throughout the animal's life and their welfare must be guaranteed during [transport](#). The use of any type of electrical stimulation or tranquilisers before or during loading and unloading is strictly forbidden. [Slaughter](#) methods are designed to be as quick and painless as possible. However, animal welfare associations have [stressed](#) that some ill-defined provisions and inappropriate practices must be redesigned and improved.

Organic food production in the world

In 2013, over 43 million hectares (ha, 1ha = 10 000 m²), in 170 countries around the world, were cultivated organically.⁹ However, organic farmland only accounts for 1% of total worldwide farmland. The continent with the largest organic agricultural area is Oceania, with 17.3 million ha (98% of which is in Australia and is mainly used as grazing area for the production of organic beef), followed by Europe (11.5 million), Latin America (6.6 million), Asia (3.4 million), North America (3 million), and Africa (1.2 million).

The global market for organic products continues to grow. Over the past 30 years, international sales of organic foods have grown from almost nothing, to over €66 billion (US\$72 billion)¹⁰ in 2013. Demand is mainly concentrated in two world regions: North America and Europe.¹¹ However, over three quarters of the nearly 2 million organic producers worldwide are in Asia, Africa, and Latin America (see figure 2). This [accounts](#) for the imbalances in international trade of organic products, which is one of the most pressing issues facing global organic trade. When organic rice, soya beans, fruits, and spices are exported from Asia to Europe, for example, and they are re-exported to Asian markets as finished organic products, this not only has negative impact on their environmental footprint, but also inflates retail prices for consumers.

The largest single market for organic food is the USA (€24.3 billion) followed by the EU (€22.2 billion) and China (€2.4 billion) – a country for which official retail sales data became available for the first time in 2014 (see figure 3).

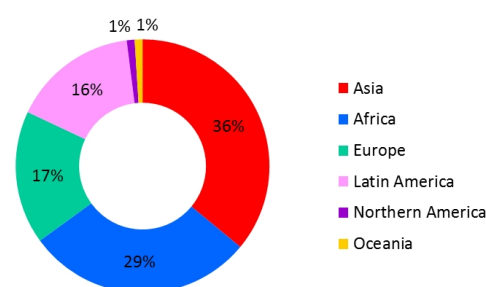
The EU organic food market

Key facts and figures

Globally, the EU continues to be a pioneer in organic agriculture and production. Experts [assign](#) this positive development to a number of reasons, among them strong consumer demand, strict legal protection and requirements for organic production and labelling as well as support for organic production. Around one eighth of global organic producers – 260 000 – are situated in the EU, and in 2013 cultivated 10.2 million ha (5.7% of the EU's agricultural area, with variations between 0.3% in Malta and 18.6% in Austria), see figure 4. Italy is the country with the largest number of organic producers (46 000), followed by Spain (30 000), and Poland (26 000).

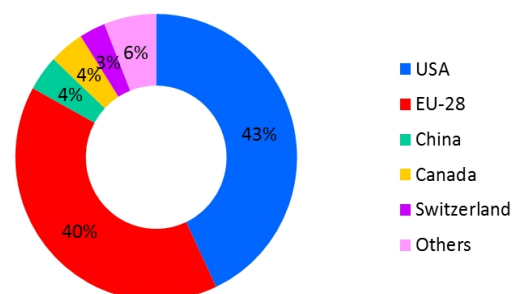
Organic farms in the EU [tend](#) to be bigger than conventional farms. Data show that about 48% of all EU holdings are smaller than 2 ha, but only 6.2% of organic farms are in this category (see figure 5). One explanation [lies](#) in the fact that the organic sector accounts for a higher proportion of holdings with extensive livestock production based on large grazing areas. In addition, organic farmers need larger holdings to secure a viable income because of the higher production costs.

Figure 2 – Organic producers by region, 2013



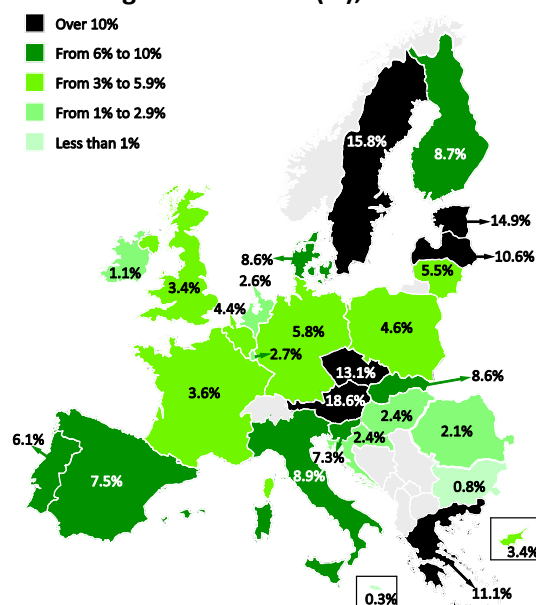
Data source: FIBL-IFOAM, [The world of organic agriculture](#), 2015.

Figure 3 – Distribution of global retail sales, value by market, 2015



Data source: FIBL-IFOAM, [The world of organic agriculture](#), 2015.

Figure 4 – Share of organic area in the total utilised agricultural area (%), 2012



Data source: [Eurostat](#), 2012.

Retail market features

In 2013, the value of the EU organic market (see figure 6) was €22.2 billion, and the overall growth rate was approximately 6% from the 2012 figures. Germany is the largest EU market (€7.6 billion) followed by France (€4.4 billion), the United Kingdom (UK, €2.1 billion), and Italy (€2 billion). The per-capita consumption of organic products in the EU is higher than in other parts of the world. The highest per-capita consumption in 2013 was reached in Denmark (€164), Luxembourg (€157), Austria (€127 in 2011), Sweden (€107), and Germany (€93). However, care must be taken in interpreting these figures as the costs of living differ quite considerably across countries.

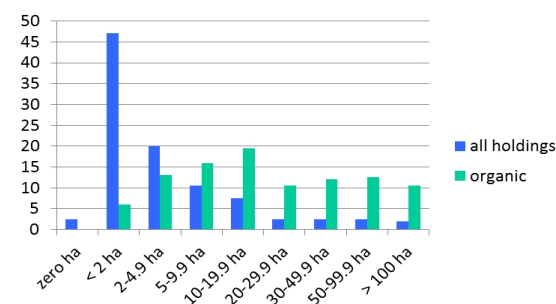
Within the EU organic market, certain products are more in demand than others. Fruit and vegetables – the pioneer organic products – now have shares of around one fifth of many national organic markets and are especially prominent in Italy, Ireland, Sweden, and Germany.

In northern Europe, animal products, especially milk and dairy products, represent a substantial share of all organic products (up to 20%). Meat and meat products are very successful and account for around 10% of the organic market in Belgium, the Netherlands, Finland, and France. However, organic animal production still remains limited in comparison with total EU animal production (between 0.5 and 4% depending on the animal species). The pork sector has the lowest share. Experts [suggest](#) that this can be partly ascribed to the difficulties posed by the provision of organic feed and the high price for final consumers. The highest market shares are found in the sheep and bovine sectors.

Beverages – mainly wine – attract a substantial part of the market; more than 10% in France and Croatia. Hot beverages (coffee, tea, and cocoa) represent 3% to 5%. Grain mill products – which are easily stored in supermarkets – reach high shares in the Czech Republic and in Finland. Bread and bakery products have an important place in the organic product range, with around 10% in the Netherlands, France, Sweden, Finland, and Germany.

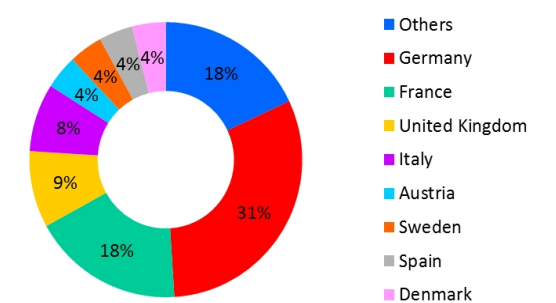
Data [show](#) that the vast majority of Europeans buy their organic products in specialised shops (67%) and supermarkets (65%), see figure 7. However, these average figures mask important [variations](#) in marketing channels across countries. In the past, Austria, Denmark, and the UK experienced strong growth of organic products sold in supermarkets. However, the financial crisis slowed down sales growth in these markets, whereas it continued to progress in the specialised channels.

Figure 5 – Share of holdings in different size classes, 2010



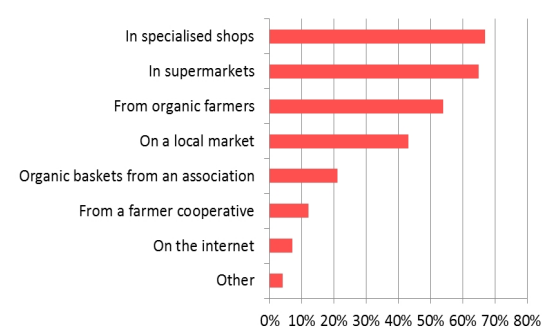
Data source: European Commission, [Facts and figures on organic agriculture in the EU](#), 2013.

Figure 6 – Distribution of EU retail sales value by market, 2013



Data source: FIBL-IFOAM, [The world of organic agriculture](#), 2015.

Figure 7 – Place of purchase, 2013



Data source: European Commission, [Report on the results of a public consultation](#), 2013.

Organic certification

To be able to use the EU organic logo and label their products as 'organic', farmers, processors and traders must comply with EU [requirements](#). EU Member States may opt to set up a public, private or mixed control system and designate one or more competent authorities responsible for controls (see figure 8). Competent authorities are required to organise audits or inspections of control bodies and, where needed, withdraw approval of control bodies that fail to satisfy the requirements. Control checks are carried out at every stage of the organic chain. Every operator – farmer, processor, trader, importer or exporter, with the exception of wholesalers dealing with pre-packaged products – is checked at least once a year, or more often on the basis of risk assessment. Organic products should bear the name of the producer, processor or distributor who last handled the item, the name or code number of the national certification authority, and the EU control authority. It should be noted though that the control system as set out by the Commission aims at guaranteeing the production processes but not the organic character of the products themselves, since there is no scientific way to determine whether a product is organic or not. In 2012, the European Court of Auditors [recommended](#) in its special report that the competent authorities should strengthen their supervisory role over control bodies, notably by promoting harmonisation in the definition of infringements, irregularities and corresponding sanctions.

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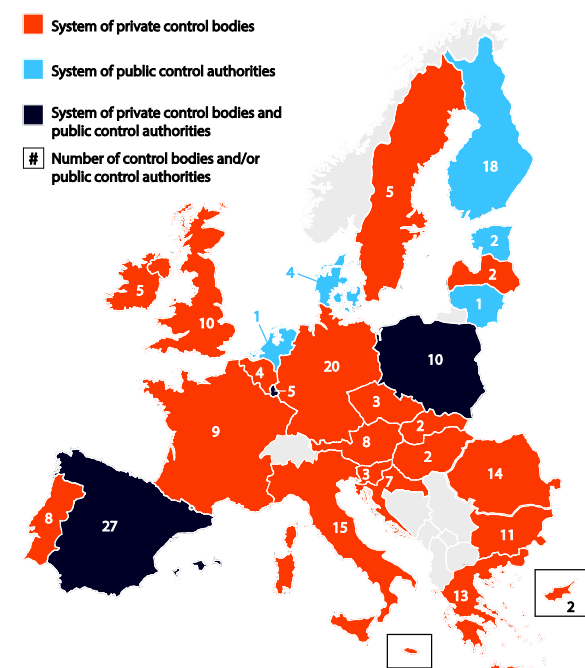
Imports and exports of organic food products

The EU regulates both organic food and drink produced and/or processed within the EU, and organic products from [third countries](#). These can be imported from non-EU countries whose rules on organic production and control are equivalent to the EU's. Currently, such agreements exist with Argentina, Australia, Canada, Costa Rica, India, Israel, Japan, Korea, New Zealand, Tunisia, Switzerland and the USA. For all other non-EU countries, importers can have their organic products certified for import into the EU by independent private control bodies approved by the European Commission. The EU has secured recognition of EU organic rules in several important export markets including Australia, Japan, Switzerland, Canada and the USA.

What are the benefits of organic food?

The main difficulty to providing a clear-cut answer to this question seems to reside in the substantial variability in the quality and design of studies comparing organic and conventional foodstuffs, which makes it virtually impossible to compare findings. An additional difficulty seemingly comes from the fact that, when assessing the results of existing studies, at least three different aspects are treated simultaneously: the difference in nutritional elements, the benefits for human health, and the impact on the environment.

Figure 8 – Set-up of the organic control system, 2011



Data source: European Commission, Commission staff working document, [Impact assessment](#), 2014.

Nutrition and health

From a strictly nutritional perspective, scientists have found little advantage in organic foods. A [review](#) from 2009 explored 52 471 articles (and identified only 55 of satisfactory quality). Analysis of these articles revealed no significant difference in vitamin C, magnesium, potassium, calcium, zinc, and copper. In 2012, a deeper [review](#) of 240 studies also found that organic foods were not significantly more nutritious than their conventionally grown counterparts. However, the authors acknowledged that the level of pesticide residues was lower among organic produce. A more recent [study](#) from 2014 reopened the debate on organic plant-based foods. Carried out by a multinational team of plant and food scientists, the review of 343 studies revealed fewer pesticide residues, and 20% to 40% higher levels of antioxidants¹² in organically grown crops. It is however unclear whether antioxidants can improve human health, and their precise role¹³ is still being [debated](#).

Health and nutrition specialists [stress](#) that the endless debate on the benefits of organic produce is just a distraction from the real issue at hand, which is that a majority of Europeans do not reach World Health Organization daily recommendations on vegetables and fruit consumption¹⁴ of any type – around 400 g per day – which is a more pressing concern. Practitioners [assert](#) that the best reason to buy organics is for their environmental impact and sustainable production values, and that any nutritional benefit should be considered a 'bonus'.

Environmental impact

Experts [claim](#) that organic agricultural practice is environmentally sustainable by nature. Soil-building techniques such as [crop rotation](#) (growing different types of crops in the same area in sequential seasons), [inter-cropping](#) (growing two or more crops in proximity), [cover crops](#) (crops planted to manage soil erosion and fertility, water, weeds, and pests), organic fertilisers and minimum tillage preserve soil fauna and flora, improving soil formation and structure, and avoiding soil erosion. The use of organic fertilisers (e.g. compost, animal manure, green manure) and greater biodiversity (in terms of species cultivated and permanent vegetation), enhances soil structure and water infiltration which, in turn, reduces the risk of groundwater pollution. Many management practices used by organic agriculture (e.g. minimum tillage, returning crop residues to the soil, cover crops, rotations, and greater integration of nitrogen-fixing legumes), increase the return of carbon to the soil, raising productivity and favouring carbon storage. The more organic carbon is retained in the soil, the higher the climate-change mitigation potential of agriculture.¹⁵ Moreover, traditional and adapted seeds and breeds are preferred for their greater resistance to diseases, and their resilience to climatic stress. Finally, the maintenance of natural areas within and around organic fields, and absence of chemical inputs, preserve habitats for wildlife.

The yield gap between conventional and organic agriculture has been heavily debated over the past decade. It has been [pointed out](#) that if Europe tried to feed itself exclusively through organic agriculture (at constant consumption), it would need an additional 28 million hectares, equal to all the remaining forests covering France, Germany, Denmark, and Great Britain combined. A similar environmental concern was [voiced](#) in a 2012 report based on findings from 71 peer-reviewed studies. The research showed that organic farming generally has positive impacts on the environment per unit of area, but not necessarily per product unit. In other words, as production requirements increase, the environmental cost of organic holdings will increase as well. In terms of greenhouse gas (GHG) emissions, the report also found that organic milk, cereals, and pork production generate higher GHG emissions per unit of output than the conventional alternative. Another report from 2012 [concluded](#) that yield differences range from 5% to 34% but are highly contextual, depending

on system and site characteristics. The authors stressed that, with good management practices, particular crop types and growing conditions, organic systems can nearly match conventional yields. The largest and most recent report to date (2014, reviewing yield comparisons from 115 studies) [confirmed](#) that organic yields are lower than conventional yields (19.2%), but asserted that two agricultural diversification practices – multi-cropping and crop rotation – substantially reduce the yield gap (to 9% and 8%, respectively) when the methods are applied in organic systems only.

However, when looking not only at production, but at food systems as a whole (production and consumption) research carried out in [Germany](#) and [France](#) suggests that consumers having a preference for organic food are more environmentally conscious and have more sustainable dietary habits. Indeed, it appeared that consumers of organic food eat less meat and therefore contribute less to high land-consumption and GHG emissions.

Pesticides: monitoring and use in organic farming

Pesticides are used in agriculture to keep crops healthy and prevent them from being destroyed as a consequence of disease and infestation. They can be synthetic (i.e. man-made) or organic (i.e. derived from natural sources and processed lightly if at all before use). They include, amongst others, herbicides, fungicides, insecticides, growth regulators, and repellents. Pesticides cannot be placed on the EU market or used without prior authorisation. In the EU, a two-tier system is in place, where the European Commission evaluates [active substances](#) used in pesticides and Member States evaluate and authorise products. Substances must be proven safe for human and animal health, and the environment.

The [maximum residue levels](#) (MRL) of pesticides in food products are [set by](#) the European Commission. Residues under these levels are considered safe for consumers. This was the case for 97.4% of all 80 967 samples examined by the European Food Safety Authority (EFSA) in its latest annual [report](#) (2013). However, activists [suggest](#) that EFSA does not use the proper methods to evaluate the combined effects of [multiple pesticides exposure](#) on human health for which little is known. The results of EFSA's 2013 report also showed that organically produced food less frequently contained pesticide residues exceeding the limits (0.8% of the samples), compared to products produced conventionally (2.7%). The most frequently quantified pesticide was copper.¹⁶ Worryingly, the level of multiple pesticide residues in fruit and vegetables has again increased (27.3% of samples compared with 26.1% in 2012).

Practitioners [claim](#) that organic food-production systems rely essentially on preventive measures. The primary form of pest control in organic farming is carried out mainly through a number of fundamental practices including crop rotation, maintenance of biodiversity and optimum crop health, and the use of resistant varieties. In general, organic growers tend to privilege the use of biological control agents, namely parasites of pests, released into the crop area.

However, the use of a certain number of organic pesticides is allowed in EU organic farming.¹⁷ Some [argue](#) that pesticides used in organic agriculture are not safer than synthetic ones, others [stress](#) that most organic pesticides have a small persistence in the environment and are, therefore, unlikely to leave residues in food. [Pyrethrins](#), for instance, are organic insecticides produced by certain species of the chrysanthemum plant. They are highly toxic to aquatic life, but are however reported to rapidly degrade in sunlight at the soil surface and in water. Research is under way to find acceptable organic alternatives for [copper sulphate](#) – a fungicide of organic origin – which is strongly bio-accumulated, meaning low doses can lead to toxic effects. Some promising alternatives [include](#) potassium bicarbonate (which is safe for humans and the environment) and milk by-products. In the meantime, restrictions limit the use of copper salts.¹⁸

Last, but not least, while taking synthetic pesticides out of food production reduces hazards to the environment and consumers, this is not the case for farmworkers. Scientists [assert](#) that compared with the general population, the rates for some types of cancer, appear to be higher among farmers, which 'may be related to exposures that are common in their work environments'

The economics of organic food

Motives affecting consumer attitude and purchasing behaviour

Currently over [200 food eco-labels](#) representing particular environmental, ethical, and/or production aspects exist worldwide. This [growing number of labels](#) causes confusion among consumers and makes it difficult for them to distinguish organic logos from competing ones.¹⁹ The [success](#) of 'Fairtrade' products seemingly resides in their clear and appealing message: certified products guarantee a [fair price](#) to growers in developing countries.²⁰ Organic food, however, means different things to different people. In the USA, for example, many consumers buy organics because they are [perceived](#) as healthier than conventional foods. In the EU, [environmental concerns](#) are the primary purchasing motive. In China, organic is [expected](#) to be high quality and safer.

Market driven organic attitudes

Leading UK [retail stores](#), such as Sainsbury, Waitrose, and Ocado increased their year-to-year organic sales by respectively 7%, 6.5%, and 10.4% in 2012. Their strong online presence and extensive organic ranges (over 1 600 products at [Waitrose](#)) account for their success in attracting organic shoppers, who tend to spend more on premium products than conventional consumers. However, analysts [argue](#) that the entry of the German discounter Aldi to the UK organic food market in 2014 could spur a price war, and fear that the increasing competition for shoppers will eventually have a negative impact on farmers and food manufacturers.

Struggling to offset the loss of customers to chains known for better-quality products, the world's largest restaurant chain – [McDonalds](#) – is increasingly offering organic semi-skimmed milk in its coffees, porridge and 'Happy Meals' in some outlets in the UK and Germany, while organic fruit juice is available in Germany and France.

The prospects of high profits and return on investment are attracting more and more [investment funds](#) specialising in 'green investments'. It has been [argued](#) that some of these schemes are financially profitable to farmers. However, there has also been [evidence](#) of some land-grabbing practices.

The recent growth in organic farming has also given rise to the 'conventionalisation hypothesis', according to which some big organic farms are increasingly functioning as modified models of conventional farms. Researchers highlight in particular the growing [influence](#) of conventional agro-food commodity chains, the [use of off-farm inputs](#) transported over a long distance (e.g. animal feed from Latin America), and their [ambiguous social impact](#), as organic farms seem to have developed more in areas with larger average farm sizes.

Why are organic foods more expensive?

The cost of certified organic foods is generally higher than the price of their conventional counterparts. Experts [argue](#) that there are various reasons which account for this difference. First of all, demand for organic food is still growing, but supply is limited. Currently, organic farmland accounts for only 1% of total worldwide farmland, and organic farms tend to produce less than conventional farms. Secondly, production costs for organic foods are typically higher because organic farming is more labour-intensive. Thirdly, organic farming techniques such as crop rotation and the use of cover crops reduce the frequency at which organic farmers can grow profitable crops. They are therefore unable to produce the larger quantities that are most cost-effective for conventional farmers. The crop losses in organic farming are also higher, which in turn, results in higher retail prices. Last but not least, to avoid cross-contamination, organic and conventional produce must be separated during processing and transportation. This involves the handling of relatively small quantities of organic foods – including in the marketing and distribution stage – which further increases the final cost for consumers. Moreover, the cost of organic foods comprises not only food production, but also a series of other factors not reflected in the price of conventional foods.

These include environmental protection and avoidance of future expenses to mitigate pollution, higher standards for animal welfare, and reduction of health risks (and future medical expenses) to farmers due to inappropriate handling of pesticides.

Endnotes

- ¹ Interestingly, the choices [linked](#) to food quality have an objective dimension relying on the physical and chemical characteristics of a product and a subjective dimension based on the consumer's perception.
- ² These terms can also be used in connection with non-food products. In some countries, the term 'eco' may suggest lower electricity consumption and the term 'bio' used in clothing, may indicate that the cotton used for a particular item originates in an organic method of production. However, misleading or comparative advertising is [prohibited](#) in the EU.
- ³ Its use is governed by EU Regulation [\(EC\) No 1924/2006](#) on nutrition and health claims made on foods.
- ⁴ In 2014, the European Commission proposed to [review](#) existing legislation to create clearer requirements for organic products by means of lifting certain exceptions, the ban on growing organic and conventional crops side-by-side, and stronger controls on imported organic products. However, in its work programme for 2015, it has [made provisions](#) for the withdrawal of the text if [no agreement](#) is reached between the European Parliament and Council by the end of June 2015.
- ⁵ The list is provided in [Annex VIII](#) of Regulation [\(EC\) No 889/2008](#). The European Commission decides on the authorisation, inclusion and withdrawal of products and substances on the list.
- ⁶ Food irradiation is a food processing technique that kills micro-organisms to improve food safety and extend shelf life. However, it can also change the chemical composition and nutritional content of food and cause the formation of radiolytic by-products which have not been adequately [studied](#) for their toxic effects on humans.
- ⁷ It should be noted that in March 2015, the European Parliament and Council [adopted](#) a Directive allowing Member States, subject to strict conditions, to ban or restrict cultivation within their borders of GMOs that have been authorised at EU level.
- ⁸ The rules on the use of private marks are set out by owners of trademarks in licence agreements.
- ⁹ Unless otherwise indicated, all statistics in this briefing are from FIBL-IFOAM, [The world of organic agriculture](#), 2015.
- ¹⁰ Amount [converted](#) on 9 March 2015, US\$1 = €0.92, €1 = US\$1.09.
- ¹¹ In recent years, the EU-US trade of organic products has been facilitated by a trade agreement for organic foods through which they [recognise](#) their respective national organic standards and control systems as equivalent. It came into force in 2012. However, animal products from the EU and apples and pears from the US are exempt from the agreement and require extra verification. Products from aquaculture and wine production are not within the scope of the agreement.
- ¹² Antioxidants form part of the plant's resistance mechanisms and are produced in response to heat, water and nutrient stress. Therefore, higher concentrations of antioxidants in organic crops [may be due](#) to higher incidence/severity of pest and disease damage, causing enhanced antioxidant production as part of the plant resistance response.
- ¹³ One of the co-authors of the study [recognised](#) that many questions still remain open about plant-based antioxidants, 'how necessary they are at different life stages, and how inadequate intakes shift the burden of disease'.
- ¹⁴ Consumption varies, with higher intakes in southern compared to northern regions.
- ¹⁵ However, more research is needed in this field. There is a lack of data on soil organic carbon for developing countries, with no farm system comparison data from Africa and Latin America, and only limited data on soil organic carbon stocks, which is crucial for determining carbon sequestration rates for farming practices.
- ¹⁶ However, copper is also an [essential nutrient](#) – necessary for humans, animals and plants – and a naturally occurring compound, which makes the evaluation of pesticide contamination through copper, very complex.
- ¹⁷ Annex II of implementing Regulation [No 354/2014](#) amending and correcting Regulation [No 889/2008](#) on organic production and labelling.
- ¹⁸ Annex II of implementing Regulation [No 354/2014](#) limits their use to up to six kg per ha per year.
- ¹⁹ A Eurobarometer survey from 2013 [shows](#) that over one-third of EU citizens – 37% – are aware of the non-EU *Fairtrade* logo, while only a quarter - 25% - recognise the EU's *Organic farming* logo.
- ²⁰ However, researchers have [voiced](#) serious concerns over the fairness of the scheme, notably in terms of wages which have shown to be typically lower, and on the whole conditions worse, for workers in areas with *Fairtrade* organisations than for those in other areas.

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