

The agri-food chain

Greece

Sectors in focus



October 2020

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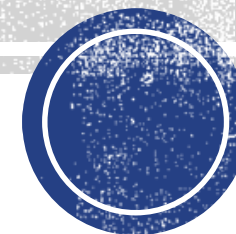


- **After the outbreak of the COVID-19 pandemic, the agri-food sector** was supported by the European Commission by the issuance of guidelines to ensure an efficient food supply chain, the introduction of measures directly supporting farmers and rural areas, and the introduction of new measures to simplify and increase the flexibility of the Common Agricultural Policy (CAP).
- **The pivotal role of the Greek agri-food sector derives from** the quality products, the strong presence of food manufacture, the connection of the Greek with the Mediterranean diet, the rich soil conditions and favorable climate characteristics, as well as the nutritional standards and food safety.
- **In Greece and many other European countries, household expenditure** on food and non-alcoholic beverages is the second largest expense after housing, water, electricity, gas and other fuels. However in Greece, this share in total expenditure is larger than the European average.
- **Food prices have been on an upward trend in Greece in recent years**, affected by higher demand and global food prices amid a highly competitive international environment. Nevertheless, the coronavirus crisis negatively impacted global food prices from February 2020 until May, with the fall being reversed in June in dairy, oils and sugar, but not in meat and cereals.
- **Agricultural production should be oriented and linked to market demand** and surpass the problems of the relatively small size of land per farm, farmers' aging and unfavourable age structure of the rural population.
- **The CAP, launched in 1962, ensures high standards of food security**, safety and quality, focuses on the support of small and medium-sized family farms and on the greater use of innovation and prioritizes sustainability linking support to environment, climate and food safety legislation.
- **Gross fixed capital formation in agriculture, forestry and fishing** cumulatively shrank by 45% from 2009 to 2017, although the losses in terms of value added were much milder.
- **The basic Greek agricultural products include** fruits and vegetables, industrial crops, cereals, forage plants, olive oil (third largest producer worldwide), potatoes and wine. Crop production has the highest share (73%).
- **Food products have the highest share among the basic manufacture sectors** in terms of persons employed (34%), value added (24%) and number of enterprises (26%) and the second highest after coke and refined petroleum products in terms of production value (22%). The GVA of the food, beverages and tobacco industry stands at 2.5% of total GVA.
- **Bakery and farinaceous products is the largest subsector of food manufacture** in terms of value added, persons employed, enterprises and turnover. Manufacture of fruit and vegetables was one of the most resilient subsectors during the economic crisis in Greece.
- **Exports of food products surged substantially over the decade 2009-2019**, far more than imports of the sector, indicating that although there is still export dependence, the sector exhibits a considerable exporting orientation, mostly evident in aquaculture products.
- **"Made in Greece branding", the Greek cuisine and the connection with the Mediterranean diet** act as an international identity of Greek food products and mark a first step towards a broad acceptance of product specific brands abroad.
- **Local, traditional products** or products of protected designation of origin and geographical indication or products with a special registration, are a typical example of the effort to create a strong local identity. Up until 2020, Greece had 275 food and beverages products registered as PDO and PGI.
- **Research needs to be intensified in the food industry in Greece, new technologies** must be further applied by also supporting the connection with the tertiary education in the production processes throughout the agri-food value chain.
- **Sustainability awareness in environmental issues related to production and consumption** in the agri-food sector has increased in recent years. The Greek agri-food sector's GHG emissions accounted for 3.3%, exhibiting the largest decrease (-9%) among EU member states in the period 2009-2018.

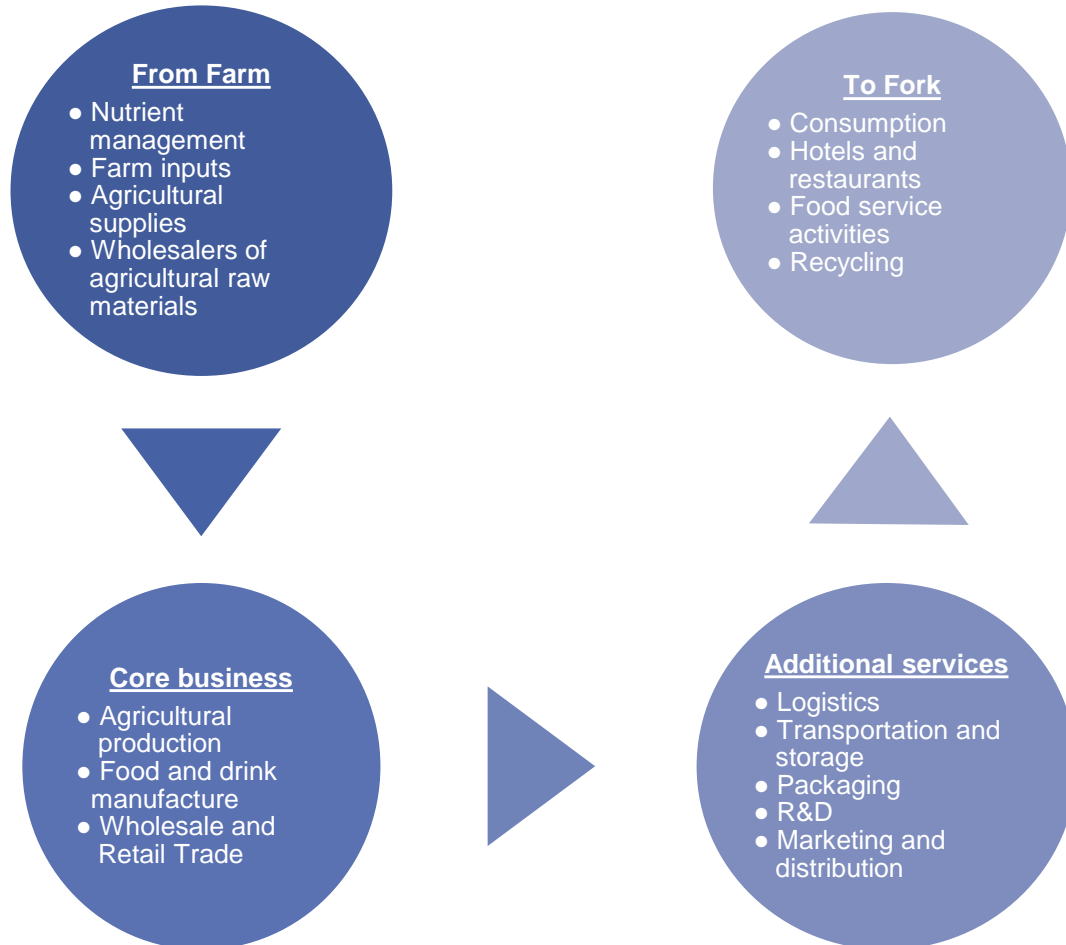
Since the outbreak of the COVID-19 pandemic, the agri-food sector of the EU-27 member states has shown resilience compared to other sectors largely hit by the crisis and was supported by the European Commission, in order to provide safe and high-quality food to the European citizens.

- The European farmers and food producers faced difficulties and rising pressure after the introduction of border controls and movement constraints within the EU in order to slow down the spread of COVID-19.
- The new pandemic crisis has unveiled:
 - The importance of a strong and flexible food system functioning in all circumstances and ensuring access to sufficient food supply.
 - The importance of the restoration of the balance between nature and human activity as people's health, ecosystems, supply chains and consumption patterns are interrelated.
 - The importance of the European Farm to Fork strategy which draws attention to the need for new and better-balanced food systems in order to protect people's well-being and health.
- Under the adverse conditions caused by the new pandemic, the European Commission supported the agri-food sector by:
 - The issuance of guidelines to ensure an efficient food supply chain by:
 - Introducing green lanes to keep food flowing across Europe.
 - Qualifying seasonal workers as “critical” to secure food sector support.
 - The introduction of measures directly supporting farmers and rural areas:
 - Flexible use of financial instruments under rural development with farmers and other beneficiaries from loans or guarantees to cover operational costs of up to EUR 200,000 at very low interest rates or favourable payment schedules.
 - Increased advances of direct payments from 50% to 70% and certain rural development payments from 75% to 85%, starting from mid-October, in order to increase the farmers' cash flow.
 - Possible higher state aid with farmers able to benefit from a maximum aid of EUR 100,000 per farm and food processing and marketing companies from a maximum amount of EUR 800,000.
- The introduction of new measures to simplify and increase the flexibility of the existing Common Agricultural Policy (CAP):
 - Extension for CAP payment applications deadline by one month.
 - Fewer farm on the spot checks.
 - Postponement of the annual reports and no requirement to partnership agreements amendments under rural development policy.
- An additional impact of the COVID-19 spread in Europe has been seen on the legislative process related to CAP reform for 2021-2027.
 - Related to the approval of the 2021-2027 European Union budget whose negotiations have been delayed by the COVID-19 crisis.
 - There were already delays in the negotiations for the proposals on the post-2020 CAP, before the outbreak of the coronavirus pandemic.
- TÜV Austria Hellas developed the Private Certification Scheme “COVID-Shield”, the first integrated certification scheme of this kind, which focuses on health, safety and business continuity to increase the confidence of citizens and consumers to businesses.
 - This scheme verifies that the mechanisms, resources and infrastructure are in line with the epidemiological guidelines to prevent the inflow or spread of COVID-19 in the facilities of the certified organization.
 - Lidl Hellas, AB Vasilopoulos, OK! Anytime Markets, Theoni Natural Water, Dimitriaki SA and Ithaki restaurant are the “COVID-shield” certified companies of the agri-food.
- The Recovery Plan for Europe includes a reinforcement of the European Agricultural Fund for Rural Development by EUR 15 bn, as well as an increase for the 2021-2027 CAP funds by EUR 9 bn.

The role of the agri-food value chain in the economy



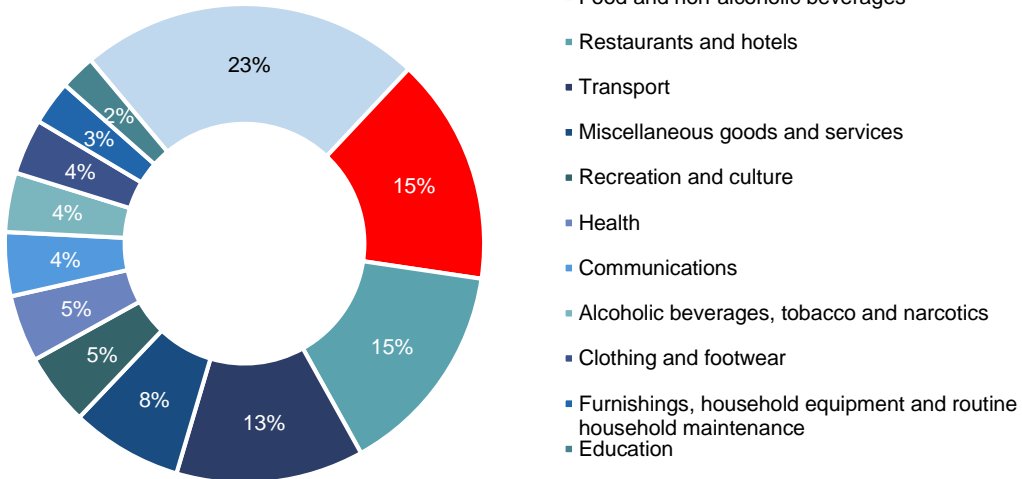
The agri-food value chain: from farm to fork



The agri-food value chain “from farm to fork” includes all agri-business activities, from inputs in the agricultural production to gastronomy and consumption of food and beverages products.

- The agri-food sector mainly includes the production processes of agriculture, fishing and forestry and food and beverages manufacture. In a broad sense, the agri-food value chain also includes other services and activities that range from inputs of farms, nutrient management and services of agricultural supplies, to wholesale of agricultural raw materials, as well as wholesale and retail trade of food products and beverages.
- Other activities of vital importance for the broad agri-food value chain are logistics, transportation and storage, packaging, marketing, promotion and distribution, technologies for food production, R&D and innovation and food service activities, such as hotels and restaurants, diet and gastronomy.
- The role of the Greek agri-food sector is pivotal because of the: a) strong presence of food manufacture in the domestic economy, b) connection of the Greek diet with the healthy and nutritious Mediterranean diet, c) rich soil conditions and favorable climate characteristics, d) strong presence of successful food companies, e) high level of food safety and quality and f) export orientation of domestic agricultural and processed food products.
- Based on the Global Food Safety Index, derived from three main categories (affordability, availability and safety and quality), Greece is ranked 11th globally in terms of quality and safety. The main strengths of Greek food products can be summarized to a) the presence and quality of food safety net programmes, b) nutritional standards and c) food safety.
- With respect to the Protected Designation of Origin (PDO) and the Protected Geographical Indication (PGI) products, Greece ranks 4th globally with 275 food and beverage products, after Italy (850), France (725) and Spain (346). Various Greek agri-food products are now identifiable, branded and inseparably related to exports, tourism and domestic culture.

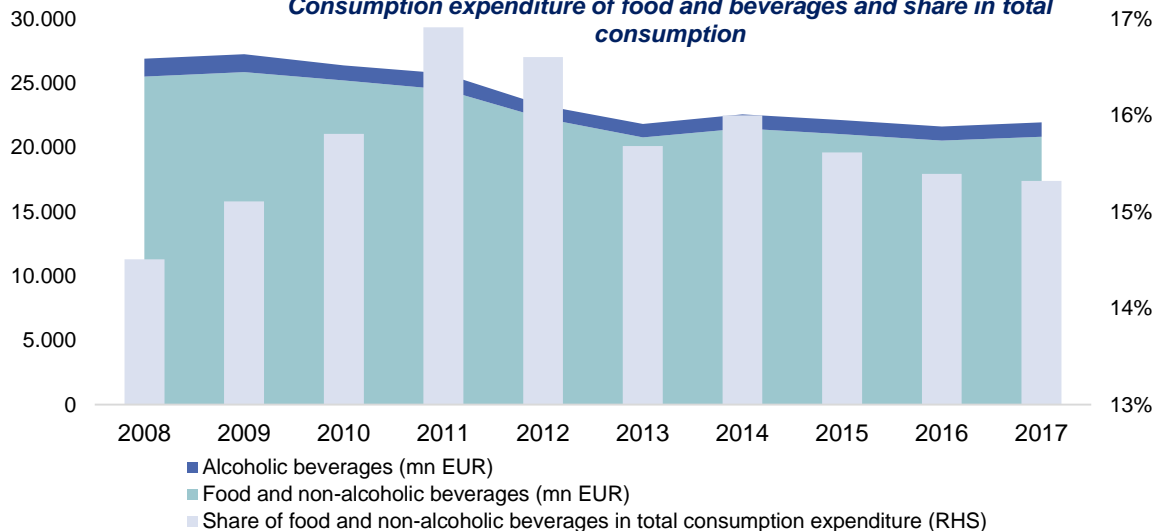
Consumption expenditure of households by consumption purpose (2017)



Food and non-alcoholic beverages household consumption in Greece accounts for c. 15% of total household expenditure, the second largest household expense, after spending for housing.

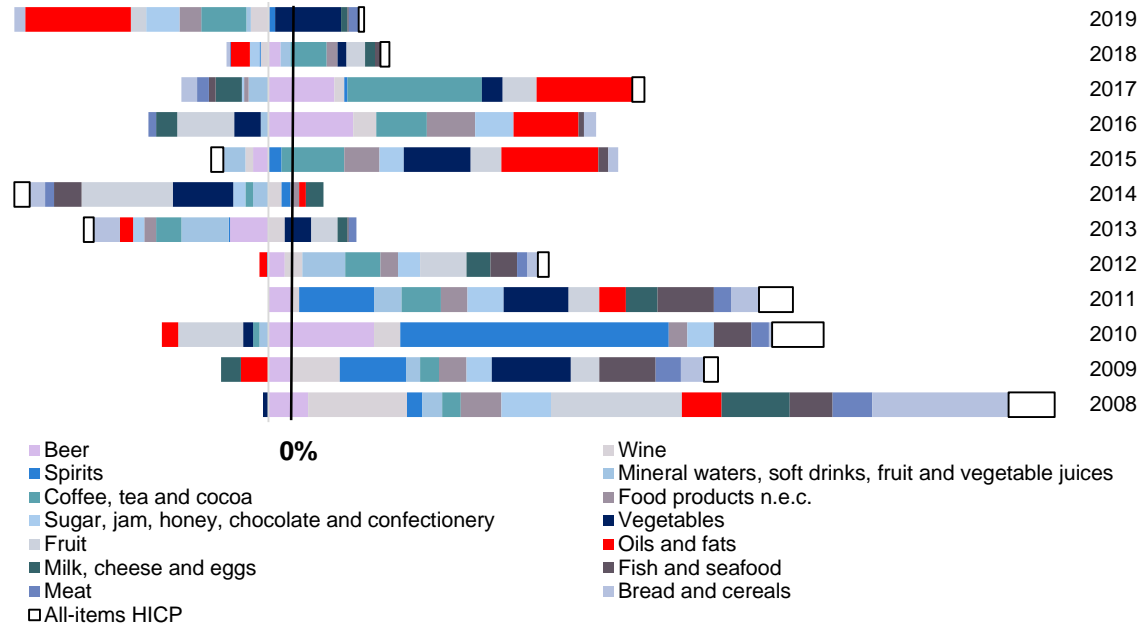
- In Greece, household expenditure for food and non-alcoholic beverages products accounted for 15.3% of total household expenditure (2017), the second largest after housing, water, electricity, gas and other fuels expenditure (23.1%), close to restaurants and hotels expenditure (14.6%).
- Adding up alcoholic beverages, this share increases to 16.1%, since alcoholic beverages consist 0.8% of total household expenditure in Greece, a share that remains relatively stable over time. Spending for non-alcoholic beverages also accounts for 0.9% of total expenditure.
- Food and non-alcoholic beverages expenditure increased by 1.4% on an annual basis in 2017, after a two-year fall, reaching EUR 20.8 bn (2010 prices). This increase was relatively lower compared to that of households' total expenditure (1.9%).
- From 2009 to 2011, consumers' expenses for food and non-alcoholic beverages as a percentage of total household expenditure increased (from 14.5% in 2008 to 16.9% in 2011), as a result of the Greek economic crisis, along with other products of relatively inelastic demand, such as housing, water, electricity and gas (from 18.8% in 2008 to 22.3% in 2011).
- The average of food and non-alcoholic beverages share in total household expenditure is lower compared to that of Greece in the EU-27 and the Euro area, standing at 13.1% and 12.5% respectively (2018).
- Food and non-alcoholic beverages consumption is the second largest in the EU-27 as well, together with transport, after housing, water, electricity, gas and other fuels expenditure (23.0%). Alcoholic beverages' share in total expenditure accounts for 1.6% in the EU-27.
- Among the EU-27 member states, household expenditure for food and non-alcoholic beverages as a percentage of total household consumption vary significantly from 8.7% in Luxemburg to 26.8% in Romania (2018).

Consumption expenditure of food and beverages and share in total consumption



Note: in the diagrams, the decimal point is depicted by a comma, and the digit group symbol by a dot.

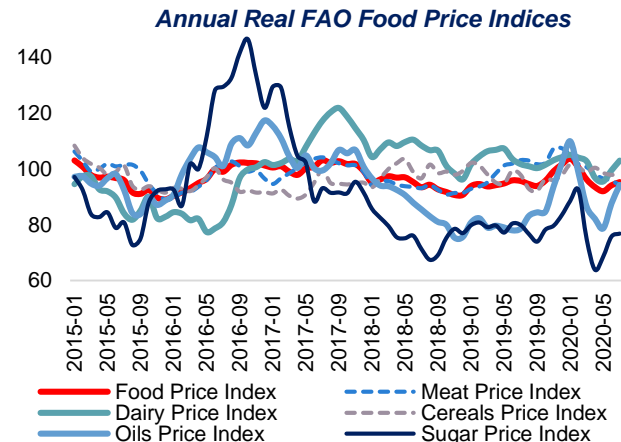
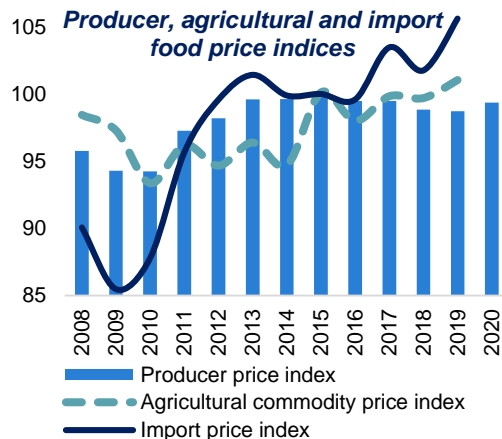
Source: Eurostat, Final consumption expenditure of households, Data processing: Alpha Bank

Food and beverages products prices annual average rate of change


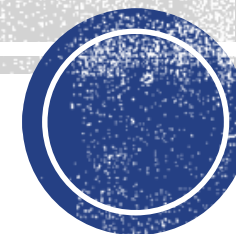
2019
2018
2017
2016
2015
2014
2013
2012
2011
2010
2009
2008

Food prices in Greece have been on an upward trend in recent years, affected by higher demand and global food prices amid a highly competitive international environment.

- Food prices are affected by fluctuations in demand - for example due to changes in income or population - but also by shifts in production and supply, derived from diverse climate conditions, natural disasters or floods, changing crop yields, trade barriers, oil price fluctuations and speculative pressures on commodity derivatives of raw materials.
- In Greece, the Harmonised Index of Consumer Prices (HICP) increased by 0.5% yoy in 2019, at a lower rate compared to 2018 (0.8%). The changes of the HICP during the last years have been affected by the prices of oils and fats, vegetables, coffee, tea and cocoa, beer and mineral waters, soft drinks, fruit and vegetable juices. In the period 2009-2019, the largest increase was registered in the prices of coffee, tea and cocoa, beer and spirits.
- The producer price index in Greece stands at the lowest level compared to other food price indices, raising from 95.8 units in 2008 to 98.7 units in 2019 and 99.4 units in the first 4 months of 2020. The agricultural commodity price index increased at a slower pace than producer prices.
- The import price index has shown the highest increase compared to the other food price indices. It has been rising since 2010, mostly affected by the competitive international environment (2019: 105.6 units, 2008: 90.1 units).
- Global food prices, also affecting domestic prices, recorded a downward trend in the beginning of 2018 that lasted for a year, due to the trade war between China and USA, primarily evident in the prices of oils and sugar and secondarily in meat.
- The large decrease of oils and sugar prices from March to May 2020, had an impact on the overall annual real food price index, which stood at 96 units from January to July 2020.
- The coronavirus crisis affected food and beverages demand and supply and subsequently the prices from February 2020 until May, with the fall being reversed in June in dairy, oils and sugar, but not in meat and cereals.



The role of agricultural production in the agri-food chain



Agricultural production should be oriented and linked to market demand, by surpassing the problems of the relatively small size of agricultural land per farm, the aging of farmers and the negative age structure of the rural population.

Farm size, farmers' age gender and training

- High levels of land fragmentation in Greece is a persistent problem that past policies failed to address effectively, hindering the ability of Greek farmers to take advantage of economies of scale.
- The average farm size (2016) was 7 hectares (ha) in Greece and 17 ha in the EU-28. 51% of Greek farms are less than 2 ha, 26% are between 2 and 5 ha, 12% cover an area of 5 to 10 ha and only 6% are between 10 and 20 ha.
- In terms of standard output, the average size in Greece was EUR 11,100, compared to EUR 34,800 in the EU-28. Since 2005, both the average farm size and standard output have increased, while the number of farms has shown a steady decline.
- A high average age is a widespread issue in the EU, as well as in Greece. Young farmers (under 40 years) make up only 10% and 8% of the total farmers in EU-28 and Greece, respectively. Both in Greece and the EU, 1/3 of farmers are over the age of 65. The profession is male dominated; only 28% and 27% of farmers are women in the EU and in Greece respectively.
- The majority of Greek farmers have practical experience only, about 9% have received basic training and only 1% has full agricultural training.
- Almost all farms in Greece are family farms (99%), the vast majority of which (98%) operate only with family workers. Of the total farms in the EU-28, 95% are family farms, 98% of which operate only with family labour.

Cooperatives

- Agricultural cooperatives are autonomous voluntary associations of persons that seek the economic development and promotion of their members, through a co-owned agricultural cooperative enterprise. The National Register of Agricultural Cooperatives lists 600 cooperatives, operating in production, processing and manufacturing.
- Because of the small-scale and family status of farming, agricultural cooperatives and producers' groups can offer a competitive advantage to

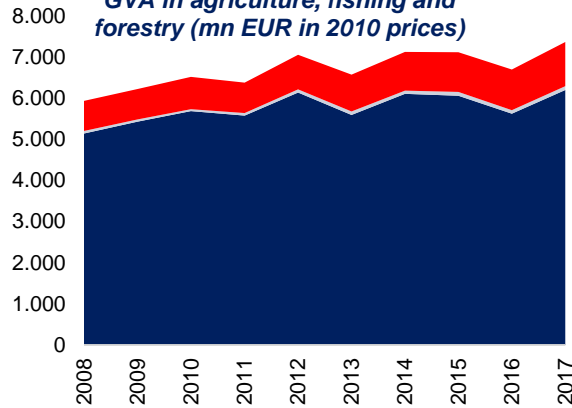
small agri-food businesses that employ less than 10 persons and represent 95% of the total number of businesses in the sector.

Contract farming and Clusters

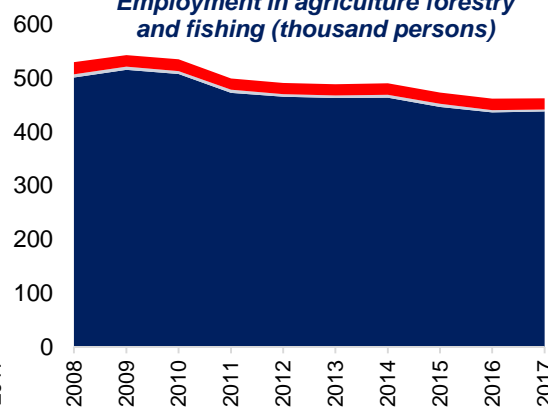
- Contract farming is a method of agricultural production, in which the producer and the buyer agree on the price and characteristics of the product. This provides a single solution to two challenges: the need for financing and a guaranteed income for producers, as well as the need for a reliable supply of raw materials to the agri-food industries, both in quantity and in quality.
- Contract farming has been present in Greece for many years and expanded significantly since 2013, including up to 25,000 producers.
- Traditionally, contract farming products included wheat (for pasta), malt, sugar, tobacco, industrial tomatoes, industrial peaches, legumes, vegetables, rice, poultry and dairy products. However, there are new products cultivated through contract farming, such as stevia, aromatic plants, fodder pulses, sunflower, pomegranate, table olives, table grapes and wine.
- Clusters are geographically concentrated company networks that share local resources and increase the overall productivity of industries. Although they could prove beneficial for producers, they exhibit limited expansion in Greece.

Aquaculture

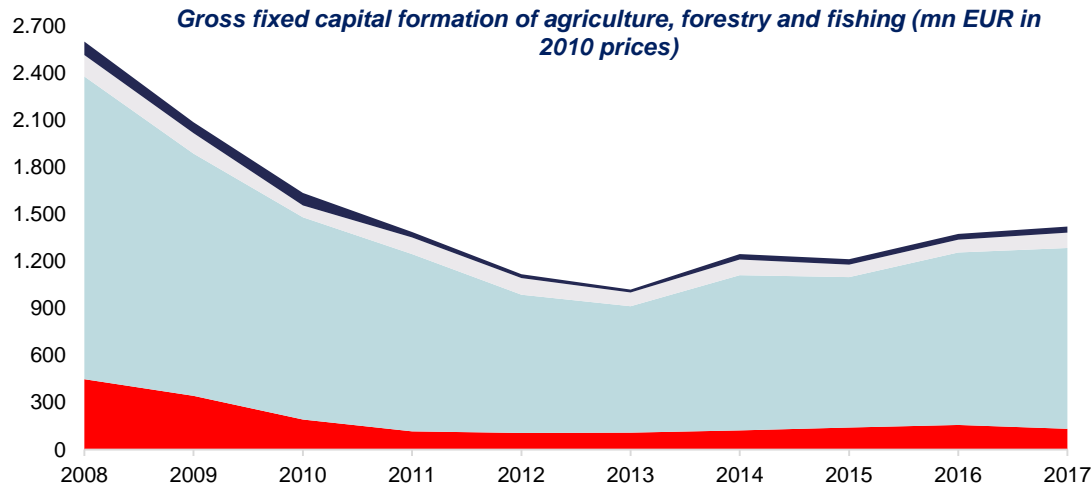
- The past year, the industry experienced changes that redefined the market structure and set a new trajectory for future investments.
- Following the M&A of two key players ("Selonda" and "Nireus") by the "Andromeda" Group and the subsequent sales of their equipment to "Philosofish", "Andromeda" now holds more than half of the market share, with "Philosofish" predicted to be the second largest producer in Greek fisheries.
- 80% of Greek aquaculture products and in specific Sea Bass and Sea Bream, are exported to 32 countries worldwide, mostly in the EU market (72%).

GVA in agriculture, fishing and forestry (mn EUR in 2010 prices)


■ Fishing and aquaculture
■ Forestry and logging
■ Crop and animal production, hunting and related service activities

Employment in agriculture forestry and fishing (thousand persons)


■ Fishing and aquaculture
■ Forestry and logging
■ Crop and animal production, hunting and related service activities

Gross fixed capital formation of agriculture, forestry and fishing (mn EUR in 2010 prices)


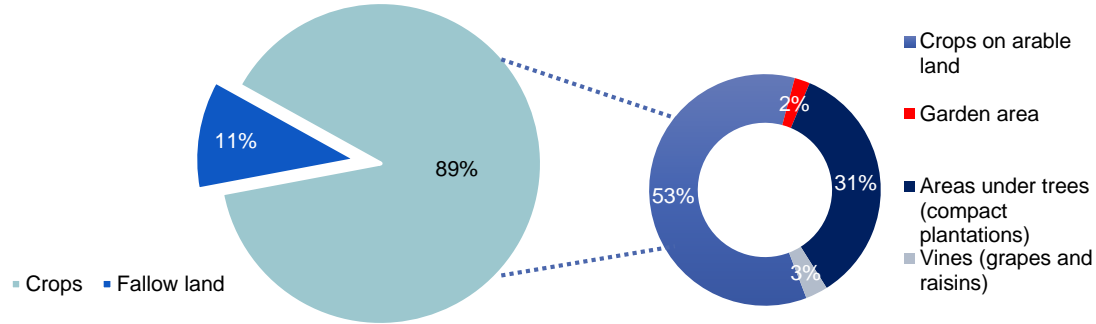
■ Other buildings and structures
■ Cultivated biological resources
■ Intellectual property products
■ Machinery and equipment and weapons systems

Source: Eurostat, National accounts, Data processing: Alpha Bank

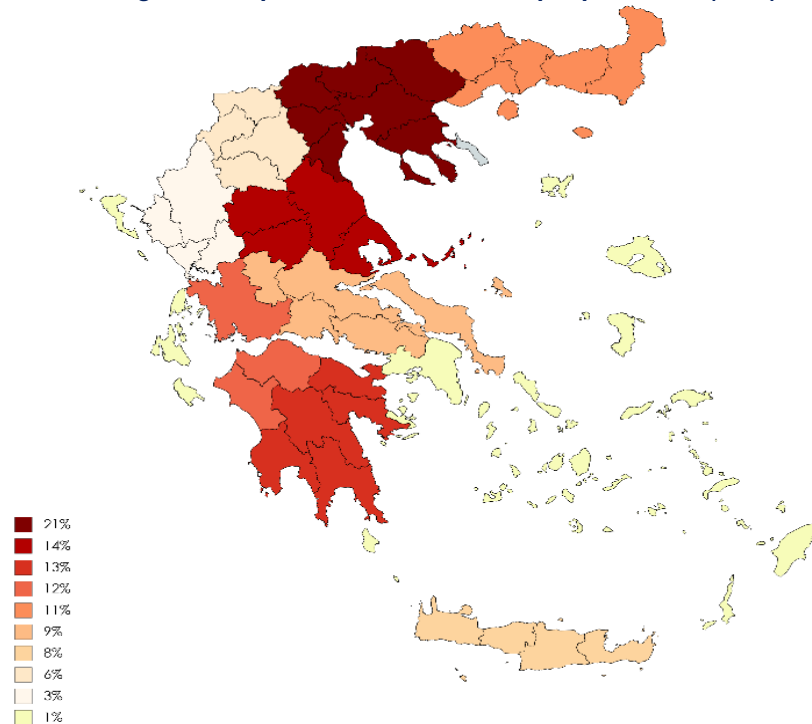
Gross fixed capital formation in agriculture, forestry and fishing cumulatively shrank by 45% from 2009 to 2017, although the losses in terms of value added were much milder.

- Agriculture, forestry and fishing includes three main subsectors: a) crop and animal production, hunting and related service activities, b) forestry and logging and c) fishing and aquaculture.
- Crop and animal production, hunting and related service activities comprise the largest share, equal to 84.5%, whereas fishing and aquaculture make up for 14.5%, with forestry and logging for a low 1.5%.
- Agriculture, forestry and fishing consists 4% of gross value added (GVA) of all economic sectors, out of which c. 85% is attributed to crop and animal production. GVA of agriculture, forestry and fishing increased by 10% in 2017, reaching EUR 7,341 mn (in 2010 constant prices).
- The GVA average compound annual growth rate (CAGR) of fishing and aquaculture stood at 4.8% during the period 2008-2017.
- In terms of investment activity (gross fixed capital formation), agriculture, forestry and fishing recorded a share of 5.9% of total fixed assets of all sectors' activities in 2017, growing from 4.6% in 2008.
- However, gross fixed capital formation of total fixed assets shrank after the previous economic crisis in Greece. In specific, agriculture, forestry and fishing exhibited a negative average annual growth rate of -4.7% during the period 2009-2017 and a cumulative loss of 45% from 2009 to 2017.
- Machinery and equipment encompasses the largest part of total fixed assets of agriculture, forestry and fishing, reaching 81% (2017), followed by transport equipment (26%), total construction (9%), other buildings and structures (9%), cultivated biological resources (7%) and intellectual property products (3%).
- In the context of the European Commission's Recovery Plan, the CAP 2021-2027 total funding for the sector was reinforced by EUR 26.4 bn (current prices), including an increase of the European Agricultural Fund for Rural Development by EUR 16.5 bn under the Next Generation EU program.

Total cultivated agricultural and fallow land, %
(2018)



Agricultural production in the Greek peripheries, % (2018)



Source: ELSTAT, <https://mapchart.net/greece.html> Data processing: Alpha Bank

The comparative advantages of Greek agriculture lie in the unique climate and soil conditions, the great biodiversity and the local varieties of quality products.

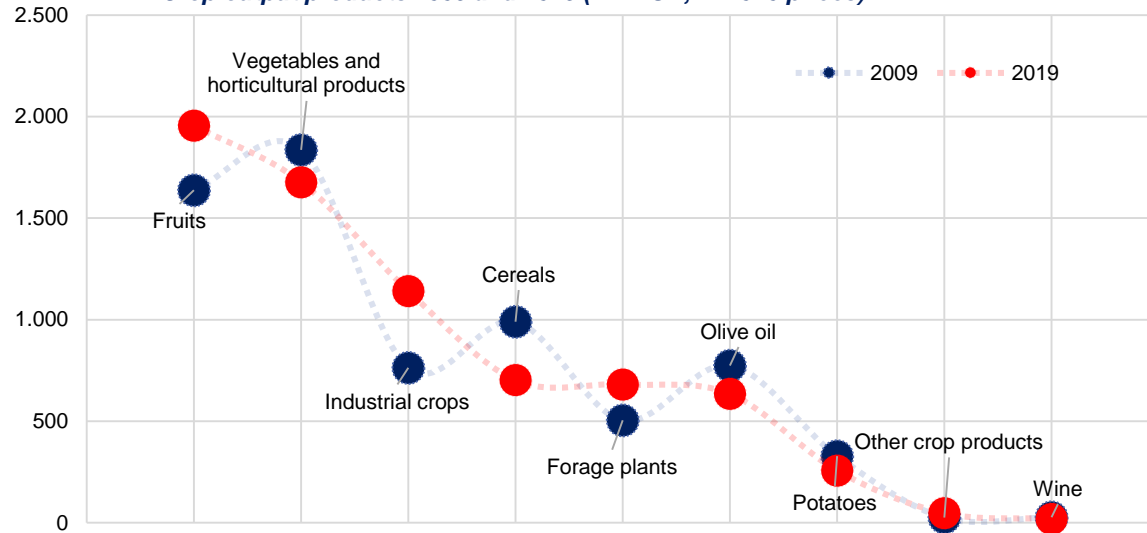
Land use and regional differentiation of production

- Out of the total 32.2 mn ha cultivated area of Greece, 89% is crops and the remaining 11% is fallow land. The crops area consists of crops on arable land (53%), areas under trees (31%), vines (3%) and garden area (2%).
- The largest share of agricultural production, cultivated and fallow land (21%), is in the Periphery of Central Macedonia, which is the lead national producer of stone fruits (74%), fodder pulses (55%), cereals for grain (31%), pomes (31%), industrial plants (30%) and fodder plants for hay (20%).
- Thessaly follows, with a share of 14% and a similar production scheme at a smaller scale, leading however in the production of nuts (46%).
- Peloponnese and Western Greece are the third and fourth largest producers, covering 13% and 12% of agricultural production, respectively. The two regions exhibit a vastly different production structure, leading in the production of watermelons (46%) for Western Greece and citrus fruits (56%) and olive oil (36%) for Peloponnese.
- Attica, the Ionian islands and the Aegean islands cover only 1% each of total agricultural production.

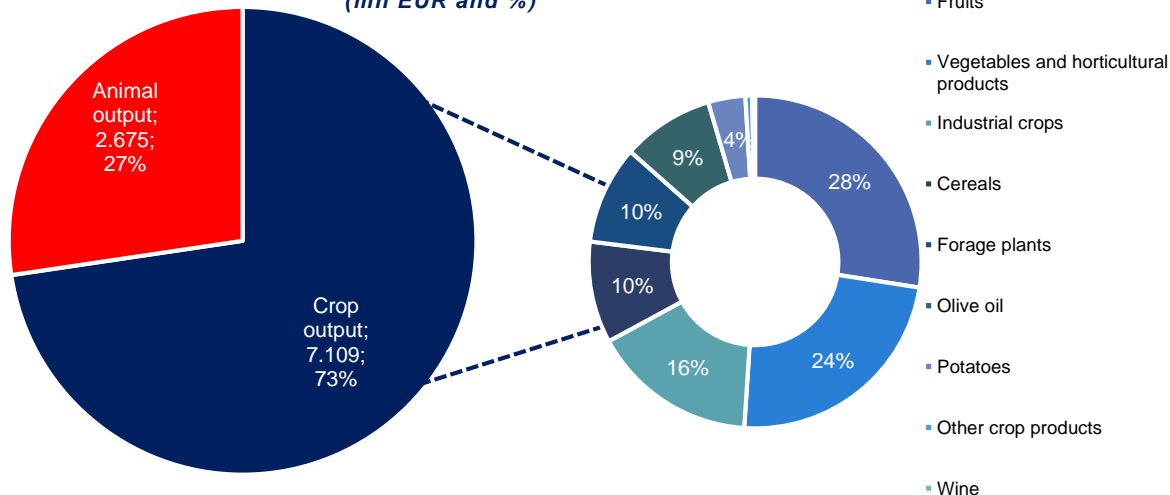
Organic Farming

- Organic farming comprises 9% of the total agricultural area – 6% being fully converted and 3% under conversion. In the EU, organic farming makes up 8% of the total agricultural area.
- 56% of this land pertains to permanent grasslands, 32% is arable land, used mostly for plants intended for animal feed production, forage or renewable energy production, 10% is olive groves and 2% fruit trees and vines.
- As with agricultural production, Central Macedonia has the largest share of organic areas (16%), followed by Western Macedonia (14%), Thessaly (13%), Eastern Macedonia (13%) and Crete (13%).

Crop output products 2009 and 2019 (mn EUR, in 2010 prices)



Agricultural goods output (mn EUR and %)



Source: Eurostat, Economic accounts for agriculture, Data processing: Alpha Bank

The basic agricultural products of Greece include fruits and vegetables, industrial crops, cereals, forage plants, olive oil, potatoes and wine.

Crop production

- Crop production holds the highest share (73%) of the total agricultural goods output, reaching EUR 7,109 mn in 2019.
- Fruits and vegetables accounted for half of the production value, at 28% and 24% respectively, followed by industrial crops (16%), and cereals (10%). Forage plants and olive oil contribute c. 10% of the crop output each (2019).
- In 2019, the production value of vegetables, cereals and olive oil had increased, compared to 2009, while the production of fruits, industrial crops and forage plants showed a decrease compared to the same year.

Animal production

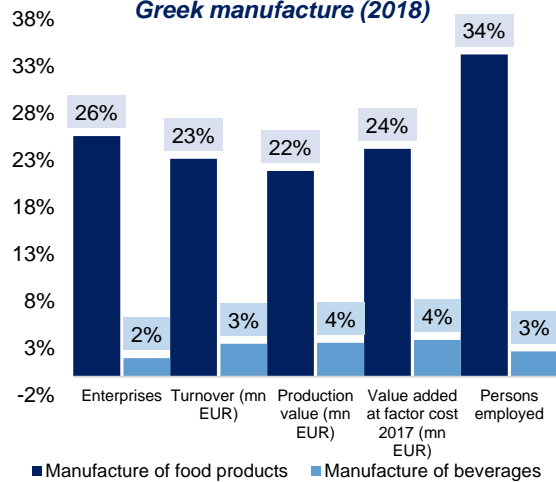
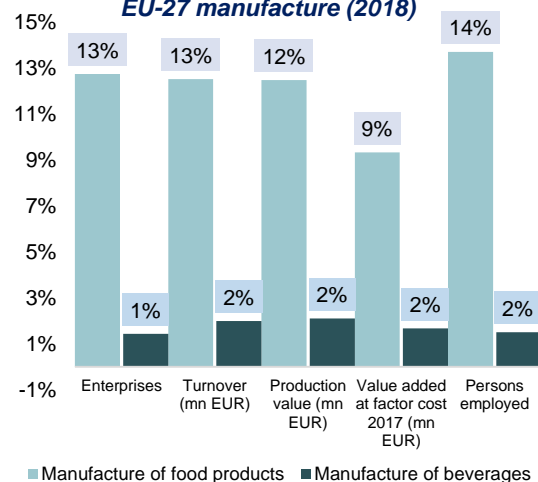
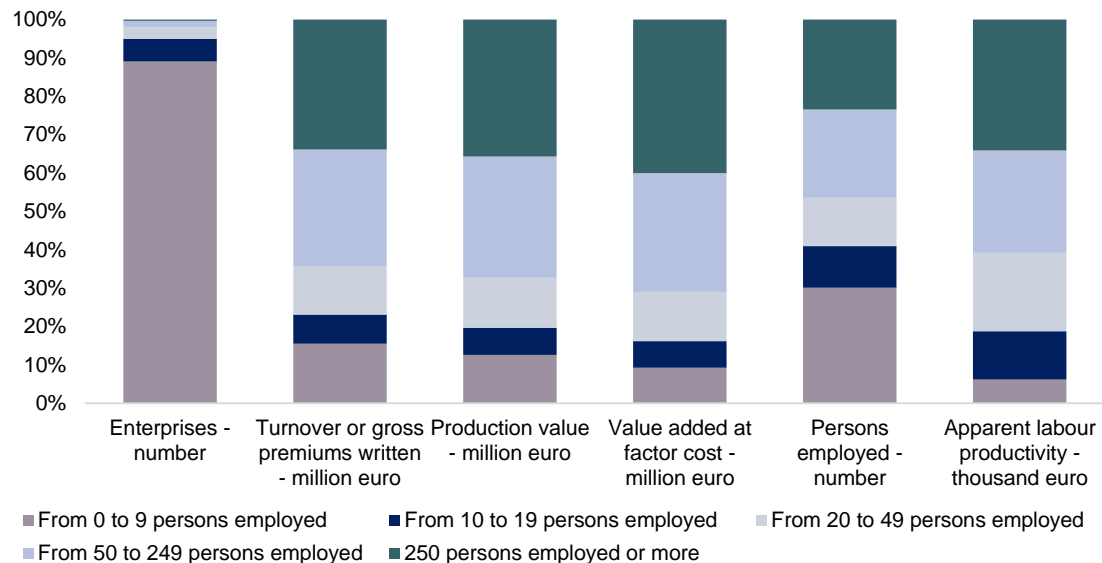
- Animal products represented 27% of total agricultural goods output, valued at EUR 2,675 mn in 2019. Half of the animal production was meat, 42% milk and 8% various other products, such as eggs and raw wool.
- Animal meat production is primarily focused on the production of poultry (94%), more than half of which is concentrated in the region of Epirus (54%).
- Milk production is split between sheep (46%), cattle (33%) and goat (21%) and takes place mainly in Central Macedonia (27%) and Thessaly (16%).

Aquaculture

- Aquaculture accounted for 64% of total fish production and 68% of the estimated value of fish products in 2019, while fishing practices contributed to 36% and 32% of production and estimated value, respectively.
- Most fish farms are located in the regions of Thessaly and Central Greece (27%) and the Aegean sea (16%), while fishing activities take place in northern Greece, in the Strymonian and Kavala gulfs, the shoreline of Thasos island and the Thracian sea (28%) and in the Thermaic and Chalkidiki gulfs (25%).

Manufacture of food and beverages

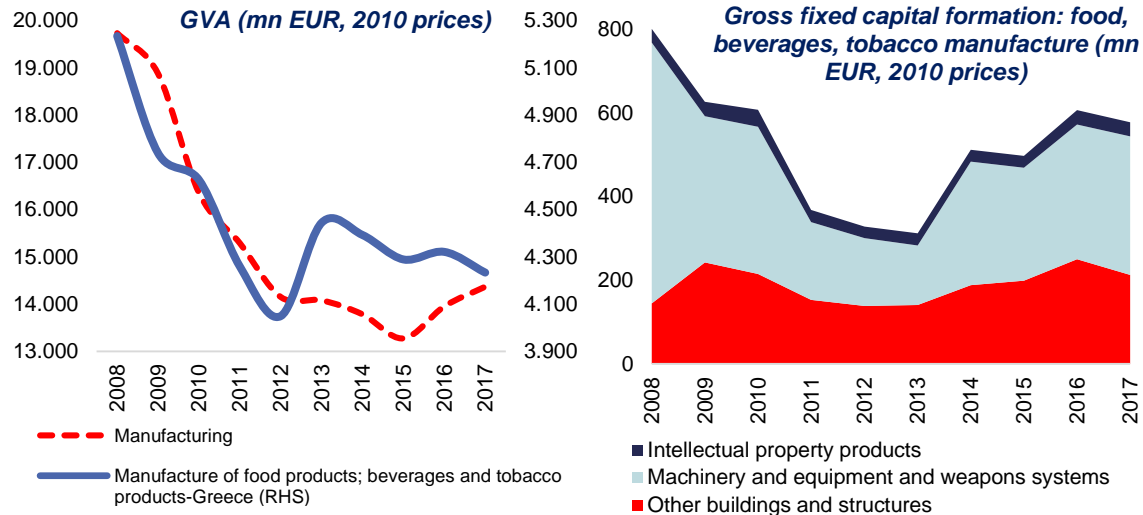


Share of foods and beverages in Greek manufacture (2018)

Share of foods and beverages in EU-27 manufacture (2018)

Food manufacture - per enterprise size basic figures (2017)


Source: Eurostat, Structural business statistics, Data processing: Alpha Bank

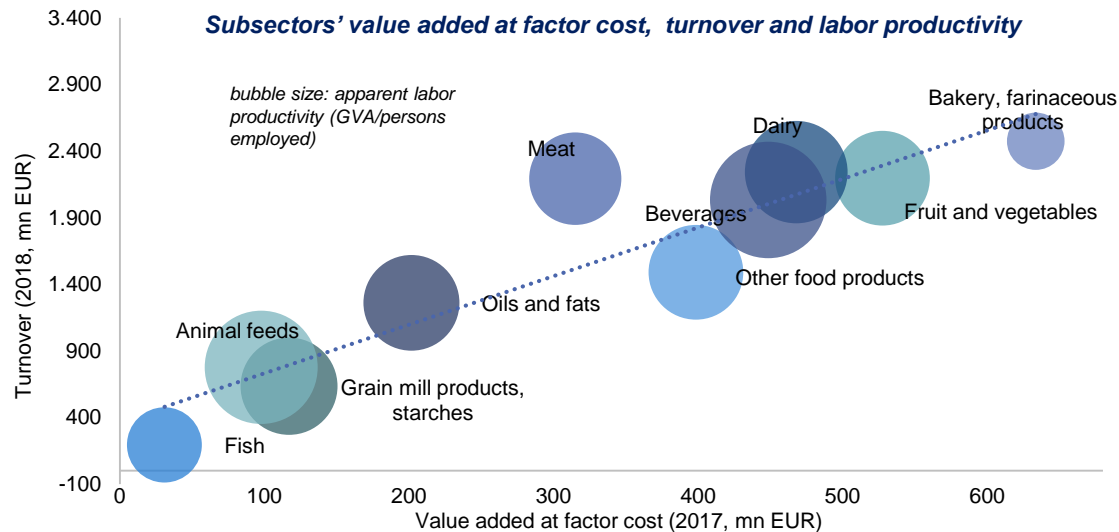
The food and drink sector of Greece has a pivotal role in the Greek economy and manufacturing industry, with a significantly larger contribution in manufacturing compared to the European average.

- Food and beverages are two separate sectors of manufacturing, although they are usually considered as one. The GVA of food, beverages and tobacco industry stands at 2.5% of the total Greek economy GVA (2017).
- Manufacture of food products includes meat, fish, dairy, animal feeds, grain mill products and starches, oils and fats, fruits and vegetables, bakery and farinaceous products and other food products.
- Manufacture of beverages largely includes alcoholic drinks, such as wine, beer, malt and nonalcoholic beverages, such as soft drinks, mineral waters and other bottled waters.
- Food products have the highest share among all other basic manufacture sectors in terms of number of persons employed (2018: 34%), value added (2017: 24%), number of enterprises (2018: 26%) and the second highest after coke and refined petroleum products in terms of production value (2018: 22%).
- Compared to the EU-27 average, the share of food and beverage in total manufacturing is significantly larger in all basic figures, as a result of the growth and resilience of the sector, but also because of the underdevelopment of other manufacturing sectors.
- Food and beverages together employ c. 121 th. persons (2018, 37% of total manufacture), out of which c. 112 th. are employed in food and c.9 th. in beverages manufacture, rendering them the largest manufacture employer.
- Food manufacturing enterprises add up to c. 15 th, out of which 89% are very small (up to 9 persons), 6% are small (10-19 persons) and only 0.4% are large enterprises of over 250 persons (2017 figures).
- The largest enterprises also have the largest share of total production value (36%), gross value added (40%), turnover (34%) and the second largest share of persons employed (23%).



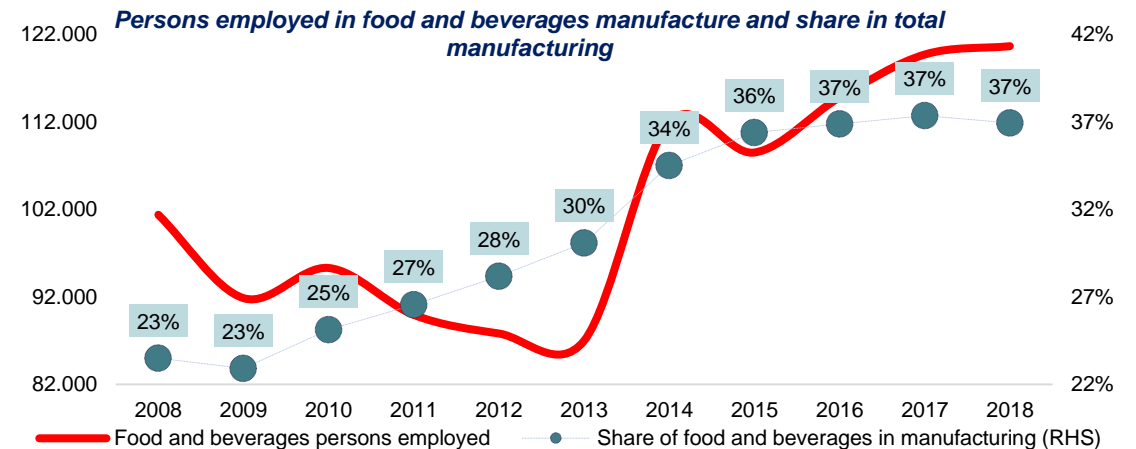
In terms of employment, investment and value added, food and beverages manufacture showed signs of resilience during the previous economic crisis, managing to recover at a much quicker pace compared to other sectors.

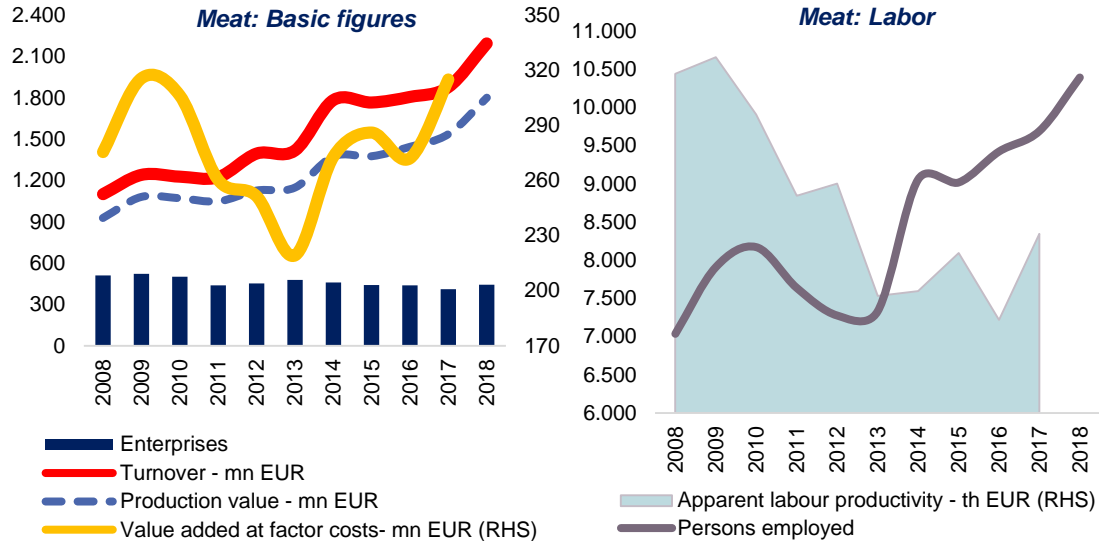
- The GVA of manufacture of food, beverages and tobacco products in Greece fell during the previous economic crisis, although at a lower pace compared to total manufacturing. The average annual growth rate of food, beverages and tobacco manufacturing over the period 2008-2017 was equal to -2.3%, whereas that of manufacturing stood at -3.5%.
- Gross fixed capital formation of food, beverages and tobacco lost 3.2% annually from 2008 to 2017, with a cumulative loss of 27%.
- Employment in food and beverages manufacture has recorded a remarkable rebound after 2013. It has cumulatively increased by 19%, whereas employment of total manufacturing has decreased by 24%.
- Bakery products exhibit the highest value added at factor cost* (2017) and turnover and the lowest apparent labor productivity (2018). Fruits, vegetables and dairy products have the second largest added at factor cost and dairy the second largest turnover. Beverages record the highest apparent labor productivity.



*Note: value added at factor cost is the gross income from operating activities after adjusting for operating subsidies and indirect taxes. Value adjustments (such as depreciation) are not subtracted. It is considered as a proxy to GVA for higher sectoral divisions in Eurostat's Structural accounts database.

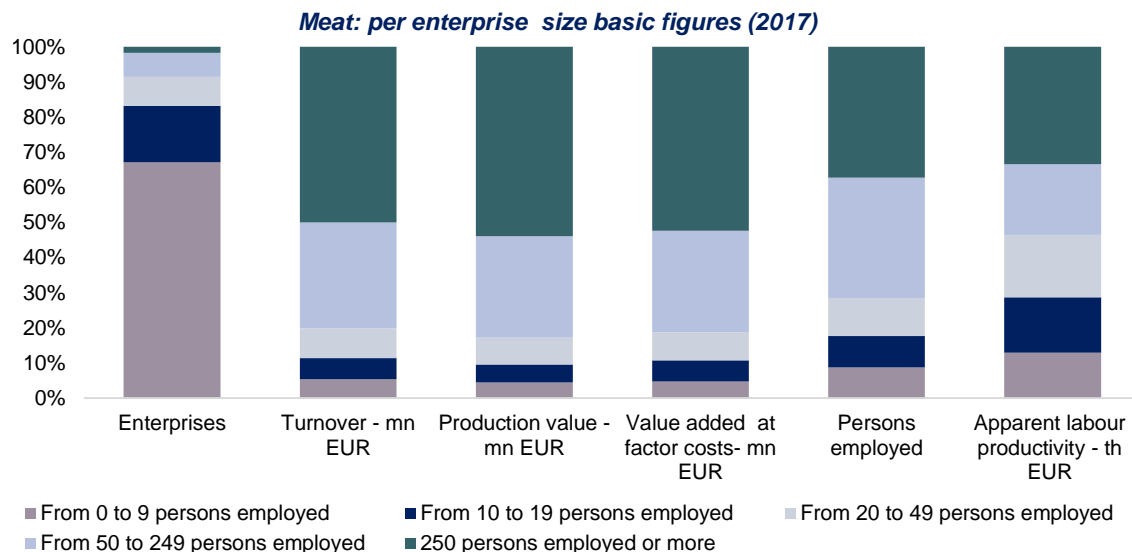
Source: Eurostat, National accounts, Structural business statistics, Data processing: Alpha Bank





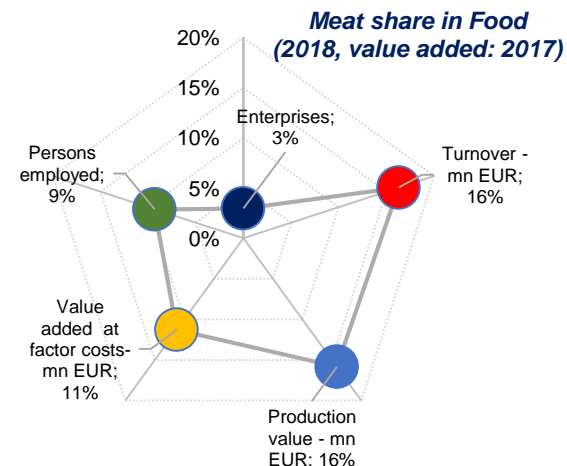
Meat manufacture employs 9% of all persons employed in food manufacture, has a 16% share of turnover, 3% of enterprises, 11% of value added at factor cost and 16% of total production value.

- The sector includes the production, processing and preserving of meat and poultry meat products. It is primarily comprised of small enterprises of up to 19 persons (83%), although 82% of the employed persons in medium and large enterprises (above 20 persons), producing 88% of the value added.
- Meat manufacture counted c. 442 enterprises in 2018, reduced from 510 in 2008. The sector recorded a strong upward trend in its turnover, which has been almost doubled in ten years (current prices, 2008-2018), with an average annual growth rate of 7.1%. It has also recovered the losses in terms of value added at factor cost since 2009, although at a slower pace. The annual average growth rate of its production value lies at a strong 6.9%.
- The sector also exhibited an increasing trend in the persons employed, from c. 7 th. in 2008 to c. 10.4 th. in 2018. Labor productivity (value added over persons employed) decreased sharply during the previous economic crisis because value added fell significantly more than employment, also exhibiting a slower recovery.



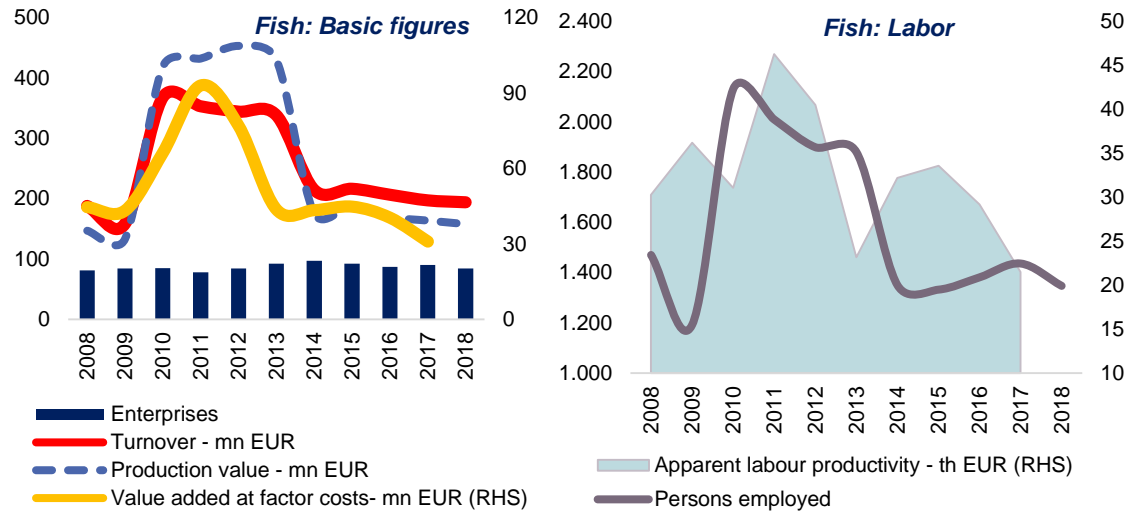
*The figures in EUR are in current prices

Source: Eurostat, Structural business statistics, Data processing: Alpha Bank



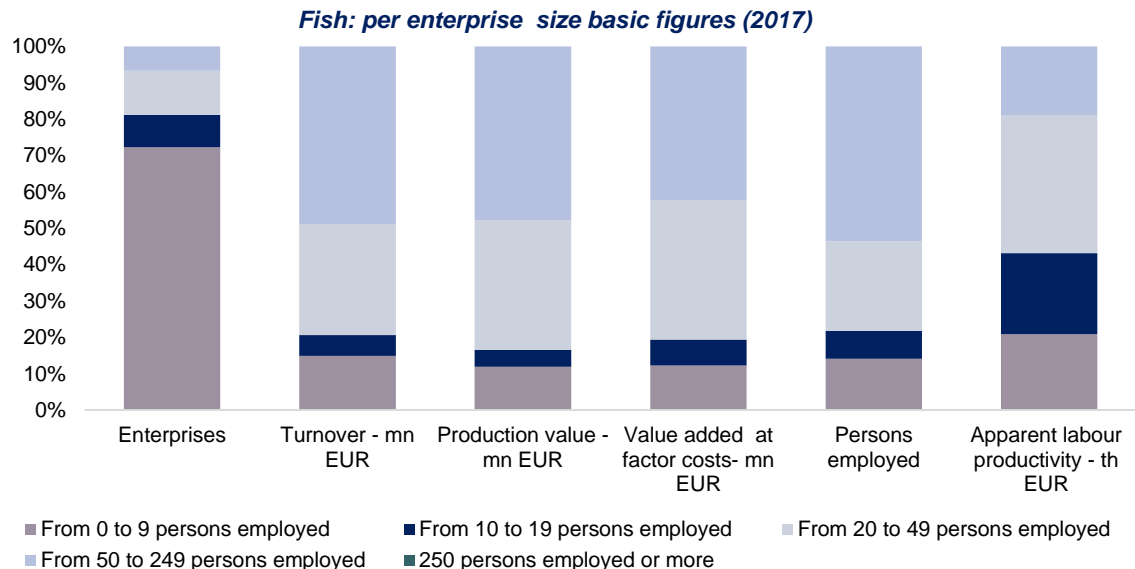
Market structure

- Production of meat and poultry meat products account for half of the enterprises and value added.
- The first 10 key players in terms of turnover are Nitsiakos, Creta Farm, Ifantis, Lantsion Meat Evrou, Edesma, Nikas, Big Hellenic Traditional Gyros, Kreka, Passias and Agrozoi, all comprising 36% of total turnover.



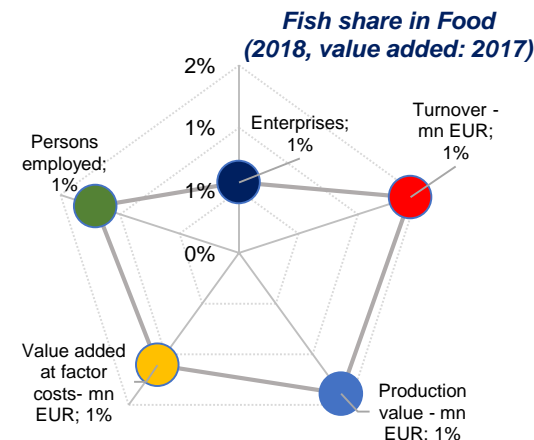
Fish processing and preserving is a small subsector with a low share of 1% of food manufacture in employment, turnover, number of enterprises, value added at factor cost and production value.

- The sector includes the processing and preserving of fish, crustaceans and molluscs. It is mostly comprised of very small enterprises of up to 9 persons (72%), whereas 78% of employed persons in medium size enterprises (20-259 persons), in which 81% of value added is produced.
- Fish manufacture counted 84 enterprises in 2018, whereas during the preceding economic crisis, there were 97 (2014). The sector reached a peak between 2010 and 2013 in terms of value added at factor cost, production value and turnover, but during the crisis completely lost its momentum, recovering only slightly until 2018. The sector has cumulatively lost c. 1/3 of its value added from 2008 to 2018.
- Processing and preserving of fish, crustaceans and molluscs exhibit a great decrease in terms of employment as well, with c. 1.3 th. persons in 2018, recording an annual average loss of 0.9%. Labor productivity fell by 54% from 2011 to 2017, reaching EUR 22 th. value added per person employed.



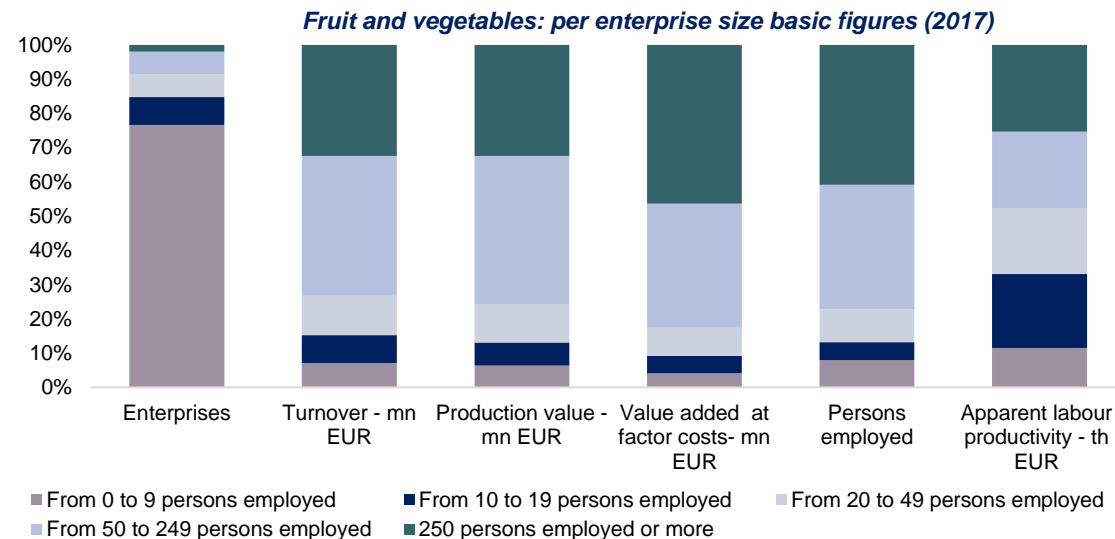
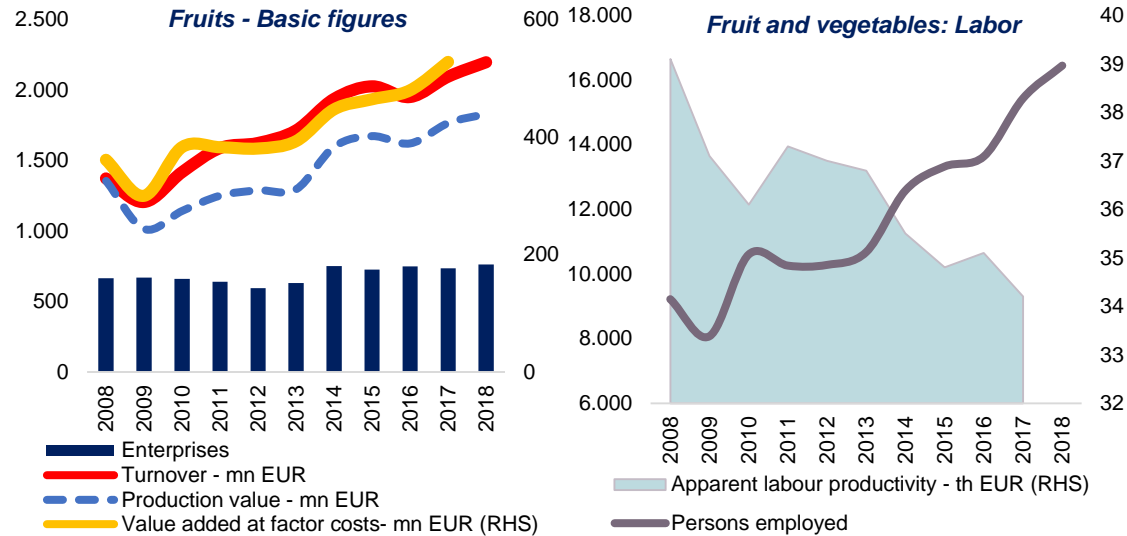
*The figures in EUR are in current prices

Source: Eurostat, Structural business statistics, Data processing: Alpha Bank



Market structure

- The first 10 enterprises in terms of turnover are Canning of North Aegean, Omiros, Fasomitakis, Sea World, Xatzopoulos-Vlachopoulos, Ichthiemporiki-Korali, Karagouni Bros, Parmenidis, Trifonidis Paulos, Anemotrata Superfish.
- These firms had a total turnover of 113 mn in 2018 or 57% of total turnover of the sector.

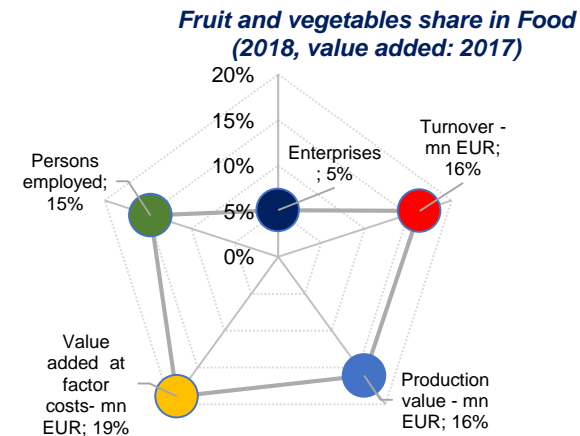


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Source: Eurostat, Structural business statistics, Data processing: Alpha Bank

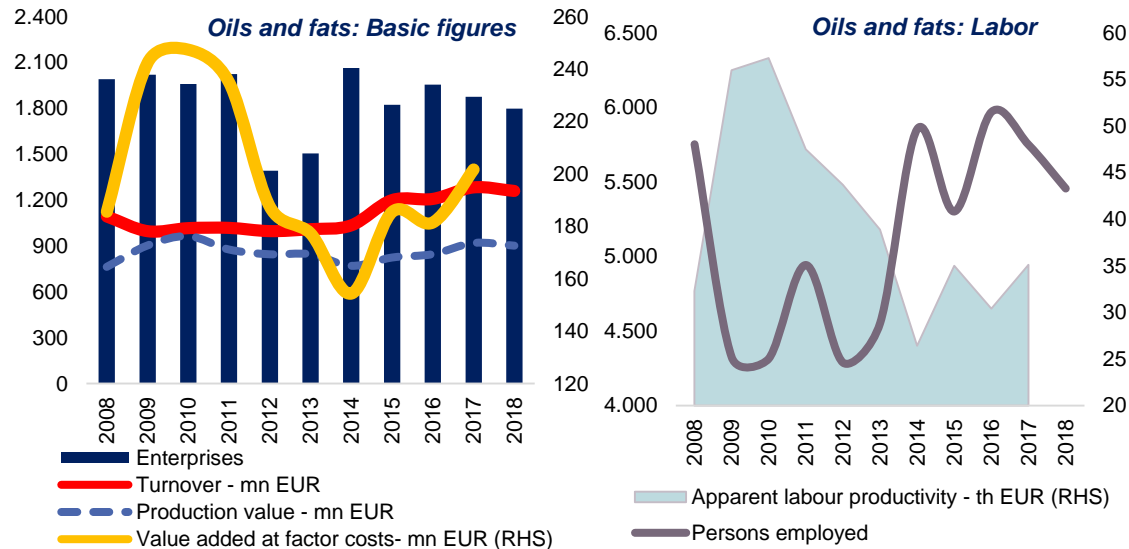
Fruit and vegetables are one of the most resilient sectors, exhibiting a significant portion of persons employed (15%), turnover (16%), value added at factor cost (19%) and production value (16%) of food manufacture, although with a rather small share of enterprises (5%).

- The sector includes the processing and preserving of potatoes and other fruit and vegetables and the manufacture of fruit and vegetable juice. It is largely comprised of very small enterprises (77%), with 87% of persons employed working in medium and large enterprises, which exhibit 91% of the value added of the sector.
- Fruit and vegetables have 763 enterprises (2018), up from 669 in 2009. The sector was among the most resilient during the previous economic crisis in Greece, with a turnover that gained 60% of its value in the decade 2008-2018. Its value added and production value did not record serious losses even during the crisis, exhibiting an almost constant growth.
- Employment lies on an upward path, since in 2018 stood at c. 16.5 th., up by 78% compared to 2008. Labor productivity decreased slightly during the same decade because the employment growth was stronger than the value added growth.



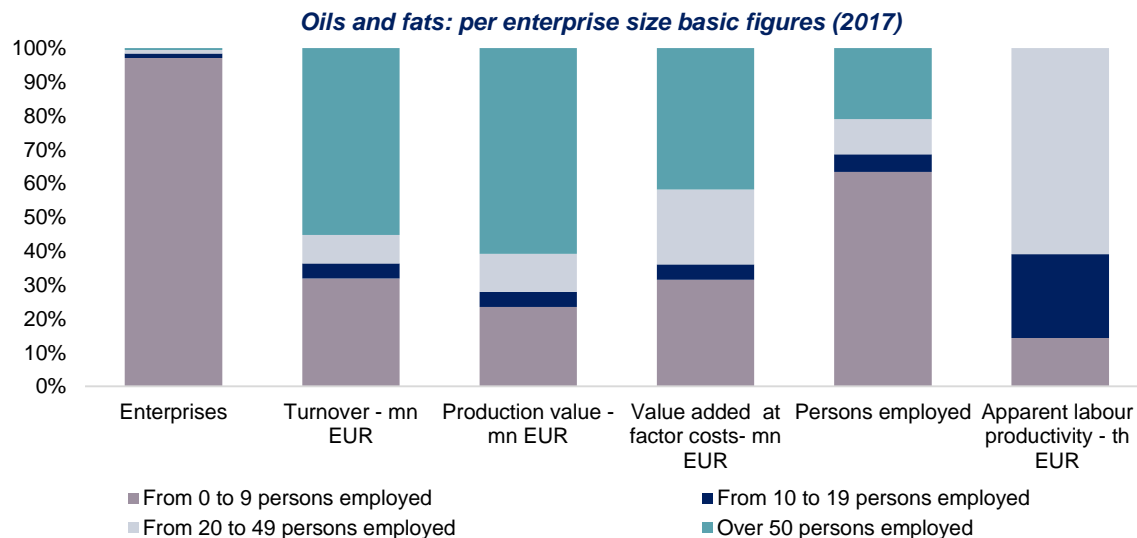
Market structure

- Other processing and preserving of fruit and vegetables account for 68% of the value added.
- The first 10 firms in terms of turnover, are Tasty Foods, Intercomm Foods, Mparmpa Stathis, Paulidis, Kronos, Konstantopoulos "Olyymp", Agro.Vim., Olympiaki of Fruits, Deas and Greek Industry of Juices Aspis K. Dedes.

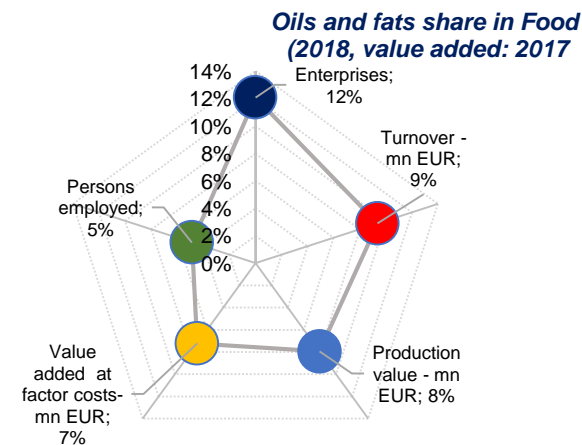


Vegetable and animal oils and fats produce 7% of value added of food manufacture and 9% of turnover, have 12% of enterprises, 5% of employment and contribute 8% in total production value.

- The sector includes the manufacture of oils and fats, margarine and similar edible fats. Vegetable and animal oils and fats have very few big firms, since 97% of its enterprises are very small firms of up to 9 employees, which produce 32% of total turnover, 24% of the production value, 32% of the value added and employ 63% of total persons of the sector.
- Vegetable and animal oils and fats had 1,799 enterprises in 2018, down from 1,991 in 2008. The sector gained 15% cumulatively in its turnover during the decade 2008-2018, with value added that, although increased since 2008 by 0.9% annually, it recorded a large drop in 2010 and has not fully recovered yet. The production value stood at the 2009 levels in 2018.
- Employment of the sector fell sharply in 2009 but has gained pace significantly ever since, standing at c. 5.5 th. in 2018. Labor productivity marked a large increase in 2009 due to the decrease of persons employed but fell sharply ever since, remaining in relatively low levels until 2017.

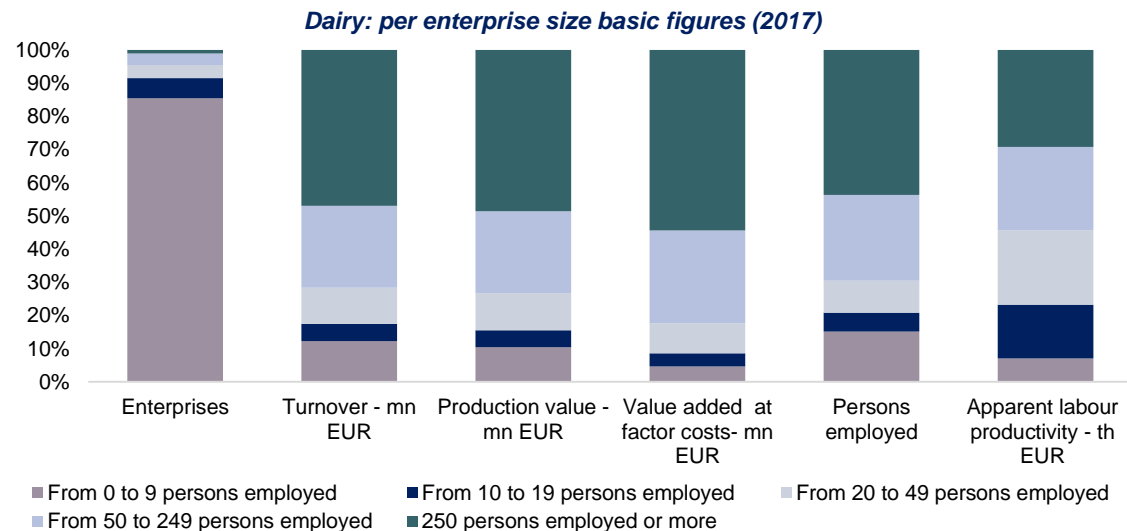
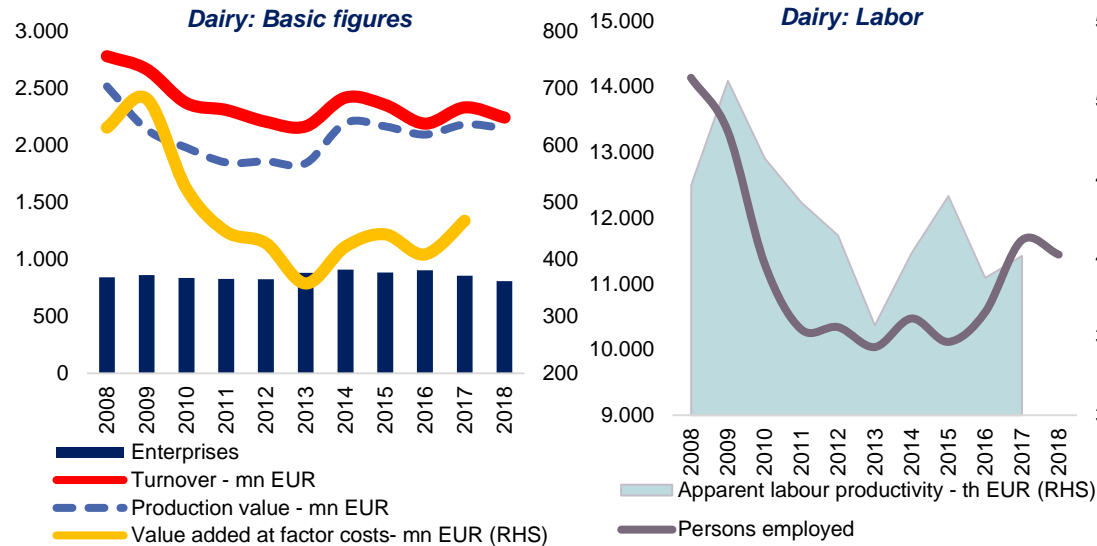


*The figures in EUR are in current prices, a new category for the size of enterprises is added due to lack of data there were missing data in Eurostat for firms of 50-249 and over 250 persons employed
Source: Eurostat, Structural business statistics, Data processing: Alpha Bank



Market structure

- Greece is the third largest producer of olive oil in the world.
- The 10 biggest firms in terms of turnover comprise 64% of total turnover. These are Sogia Hellas, Muloi Sogias, Pettas-Paulos, Kore, Nutria, Latzimas, Olympia-Xenia, Ellinika Eklekta Elaia, Amaltheia and Olive Oil Trade & Standardization Of Olive Oil.

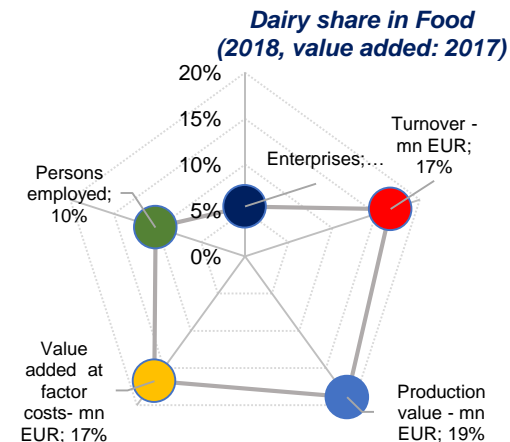


*The figures in EUR are in current prices

Source: Eurostat, Structural business statistics, Data processing: Alpha Bank

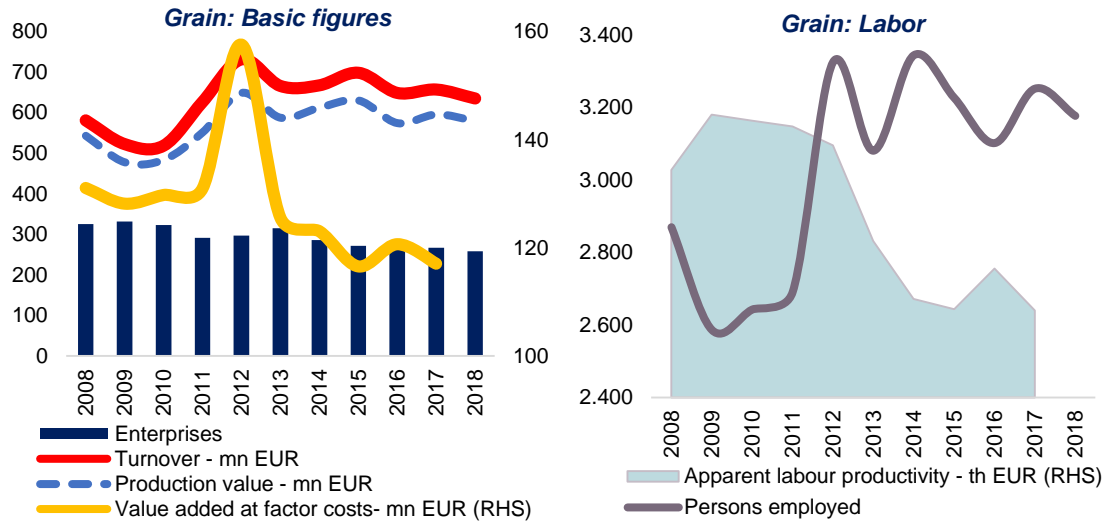
Dairy products manufacture was largely hit by the previous economic crisis and has not fully recovered yet. Dairy comprise 17% of food manufacture, value added and turnover, 19% of total production value, 10% of persons employed and 5% of enterprises.

- The sector includes the operation of dairies and cheese making and the manufacture of ice cream. It mostly comprises of very small enterprises of up to 19 persons (85%), which cover 21% of the employed persons. Large enterprises, although they consist only 1% of total, exhibit 47% of turnover, 49% of production value, 54% of value added and 44% of persons employed.
- Dairy counted 810 enterprises in 2018 (from 863 in 2009), whereas in terms of value added, production value and turnover, it has not yet recovered compared to its pre crisis levels. The sector lost cumulatively 26% of its value added and 15% of its production value in the decade 2008-2018.
- Dairy exhibit a large fall in terms of employment too, with c. 11.5 th. persons in 2018 (from c. 14.1 th. in 2008). Labor productivity, although regained some of its momentum, remained significantly lower in 2017 compared to 2008, standing at EUR 40.1 th.



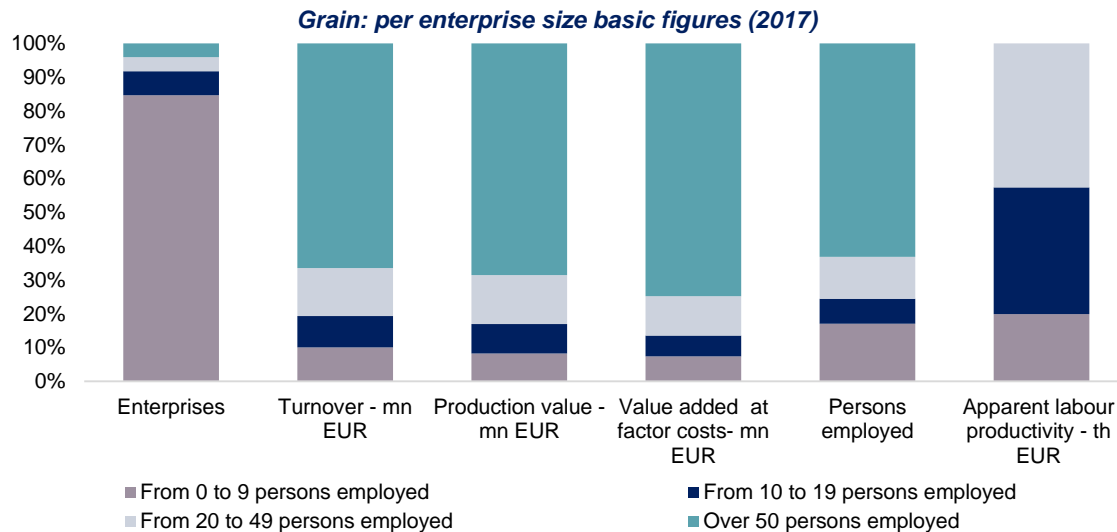
Market structure

- Operation of dairies and cheese making consist 77% of enterprises and 87% of value added. The rest is due to the ice-cream manufacture.
- The 10 largest firms in terms of turnover are Ellinika Galaktokomeia, Delta Trofima, FAGE Dairy Industry, Mevgal, Dodoni, Kolios, Kri-kri, Arivia, Little Acre Milk Farm and Epirus.

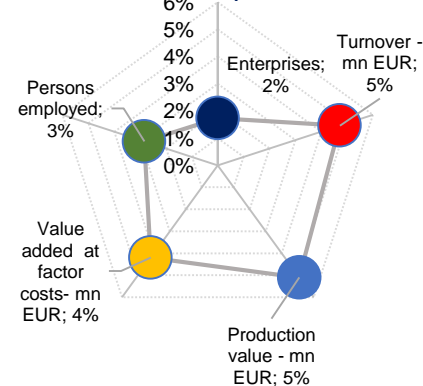


Grain mill products, starches and starch products are a rather small subsector of food manufacture, which includes 2% of enterprises, 5% of turnover, 3% of persons employed, 4% of value added and 5% of production value.

- The sector includes the manufacture of grain mill products, starches and starch products. Small enterprises equate to 92% of total firms, whereas 63% of employed persons are in medium size enterprises (20-259 persons), from which most of the value added, turnover and production value is derived.
- Grain mill and starch products had 258 enterprises in 2018, significantly reduced by 21% cumulatively compared to 2008. The sector reached a peak in 2012 in terms of value added, production value and turnover. Its value added during the decade 2008-2018 lost annually 1.2% and cumulatively 11%, but production value and turnover increased during the same period.
- The sector gained 11% of employed persons during the same decade, with a boom recorded in 2012, having c. 3.2 th. persons in its employment arsenal in 2018. Because of the large increase in employment, labor productivity fell largely in 2013.



Grain share in Food (2018, value added: 2017)

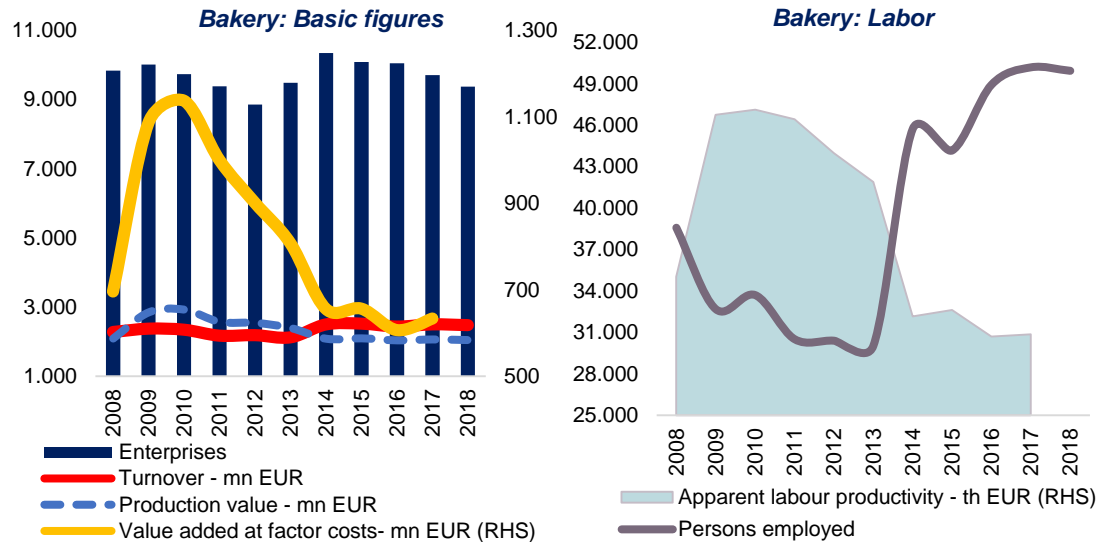


Market structure

- The first 10 players of the sector in terms of turnover are Louli Mills, Papafili Mills, Thrakis Ouzounopoulos Mills, Cylinder Mills of Crete, Kepenou Mills, Pistiolas, Rice Mills of Messinia Omega, Asopou Mills, Cylinder Mills of Chalkidiki and Sarantopoulos Cylinder Mills.
- All 10 firms consist 54% of total turnover.

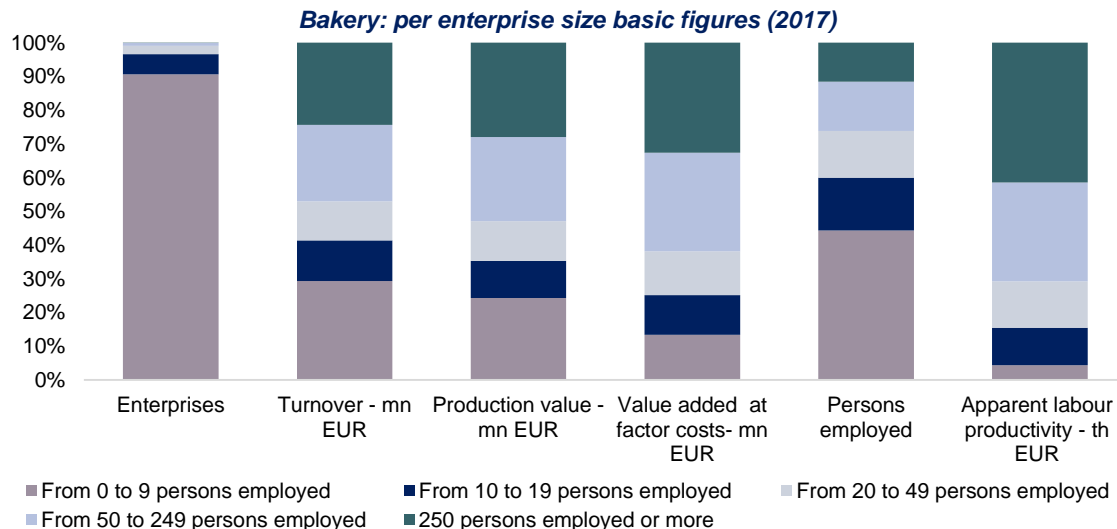
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Source: Eurostat, Structural business statistics, Data processing: Alpha Bank



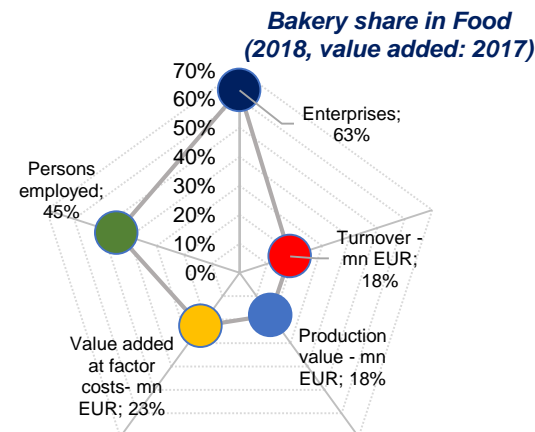
Bakery and farinaceous products comprise the largest subsector of food manufacturing in terms of value added (23% of total), persons employed (45%), enterprises (63%) and turnover (18%).

- The sector includes the manufacture of bread, fresh pastry goods and cakes, rusks, biscuits and preserved pastry goods and cakes, macaroni, noodles, couscous and similar farinaceous products. Although the largest sector of food products, bakery has only 12 enterprises with over 250 persons or 0.1% of c. 9,700 enterprises, which accounted for 28% of production value, 33% of value added at factor costs and 24% of total turnover.
- The sector's loss of value added during the 2009 Greek crisis peak has not recovered, although its turnover did not record substantial losses. Its production value during the decade 2008-2018 lost 0.2% annually and 2% cumulatively.
- The sector cumulatively increased employment by c. 29% during the same decade, with a peak in 2014. Although persons employed have reached c. 50 th. (2018), apparent labor productivity – which is the lowest compared to all other subsectors – has fallen significantly over the same period.



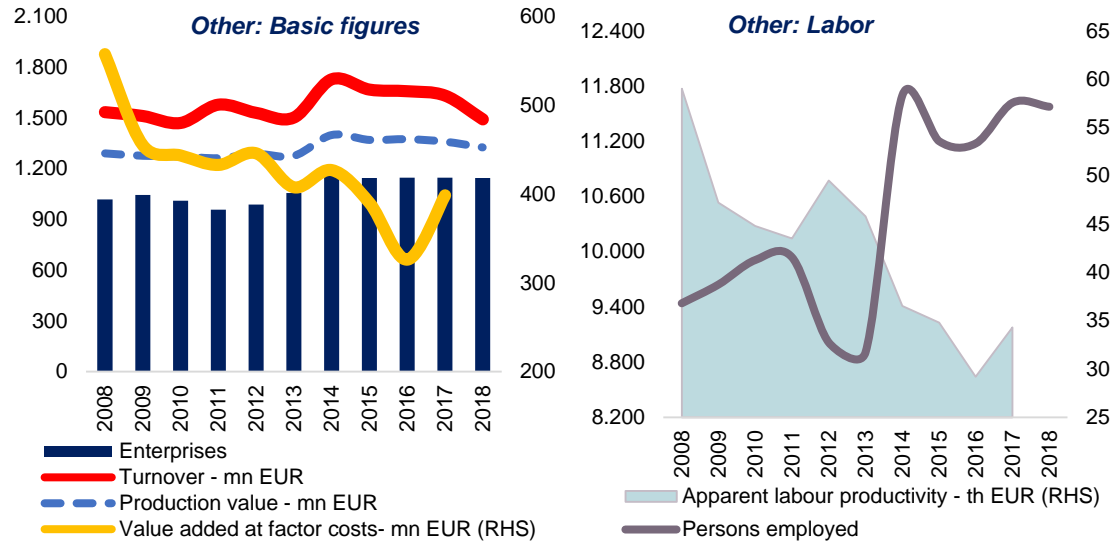
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Source: Eurostat, Structural business statistics, Data processing: Alpha Bank



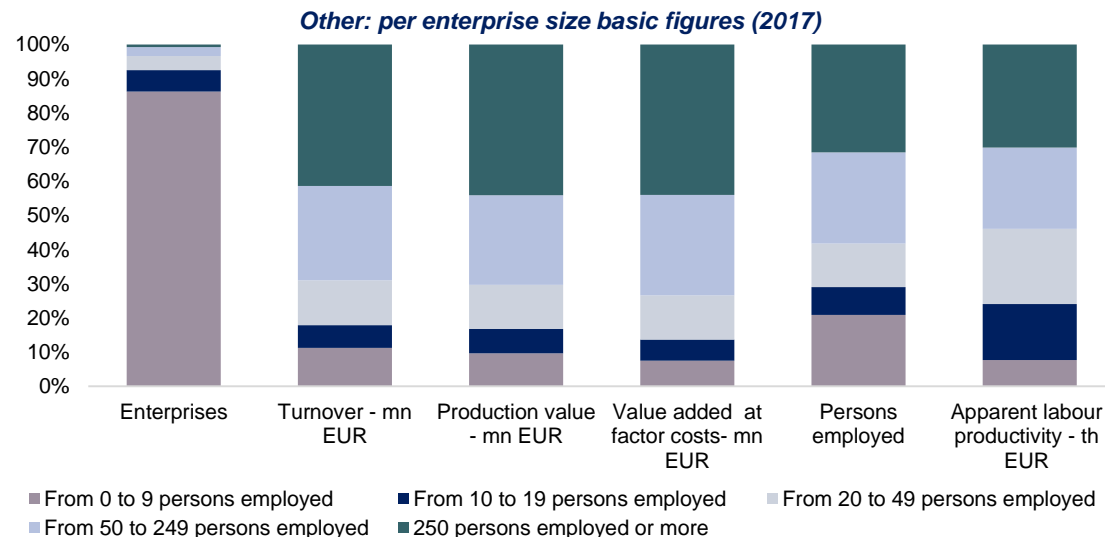
Market structure

- Bread, fresh pastry goods and cakes account for 92% of the firms and 68% of the value added, with ¼ produced by rusks and biscuits, preserved pastry goods and cakes.
- The 10 largest players in terms of turnover are Papadopoulos, Chipita, Elbisco, Hellenic Quality Foods, Arabatzis ("Hellenic Dough"), Barilla, Melissa, Karamolegos Bakery, Tottis Bingo and Hellenic Catering.



Other food products comprise 10% of persons employed in food manufacturing, 8% of enterprises, 11% of turnover, 14% of value added at factor cost and 12% of total production value.

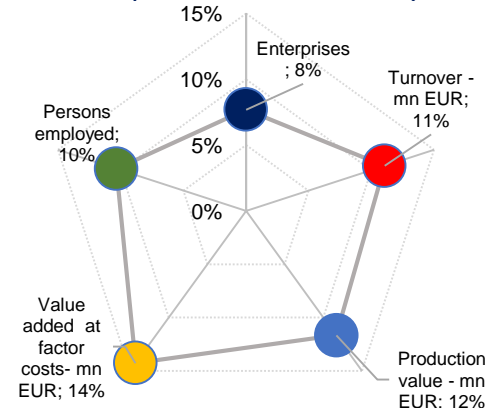
- The sector includes miscellaneous products, such as the manufacture of sugar, cocoa, chocolate and sugar confectionery, condiments and seasonings, prepared meals and dishes, homogenised food preparations and dietetic food and other food products n.e.c., as well as the processing of tea and coffee. It comprises of small enterprises up to 19 persons (92%), although over 70% of value added, production value and turnover is in medium and large firms.
- The sector counted over 1,145 enterprises (2018), increased cumulatively by 12% during the decade 2008-2018. Value added was reduced by 28% cumulatively from 2008 to 2017, whereas production value and turnover recorded an average growth rate of 0.3% and -0.3% respectively.
- Other food products employed over c. 11.5 th. persons in 2018. The trend of employment is the same as that of bakery, recording a surge in 2014. Labor productivity followed a reverse trend during the same period, due to the parallel fall of value added.



*The figures in EUR are in current prices

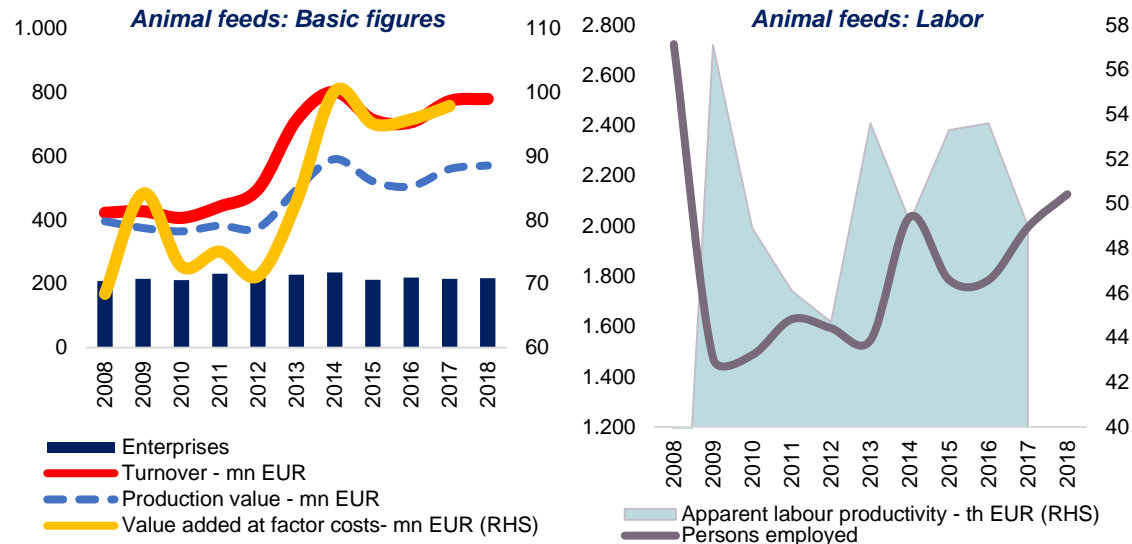
Source: Eurostat, Structural business statistics, Data processing: Alpha Bank

Other food products share in Food (2018, value added: 2017)



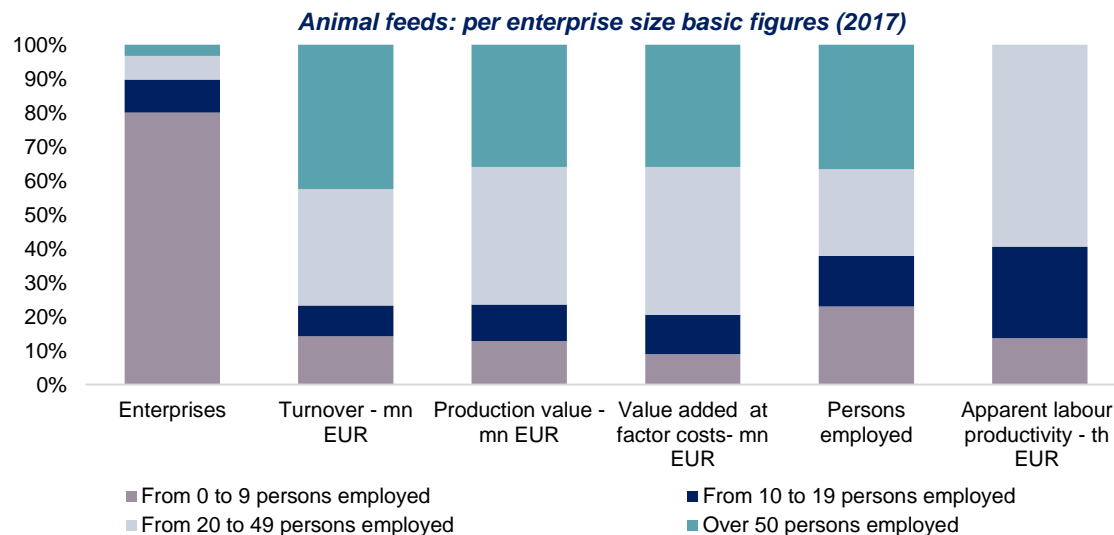
Market structure

- Cocoa, chocolate and sugar confectionery account for 33% of the value added, followed by tea and coffee (29%) and other food products (21%).
- The 10 biggest firms in terms of turnover are Nestle Hellas, ION, Giotis, Haitoglou, Hellenic Catering, Alinda-Velco, Palirria, Ari, Zanae and Cristal Hellenic.



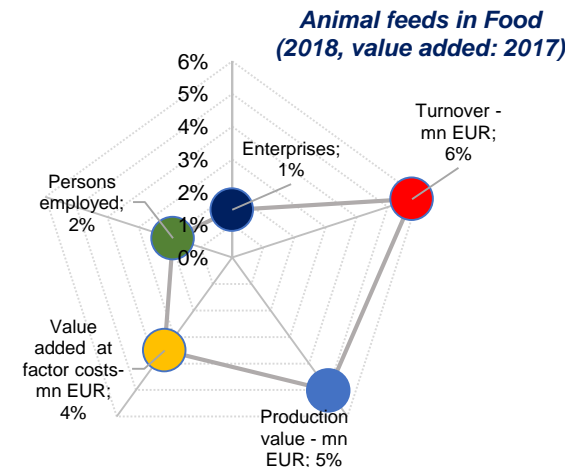
Prepared animal feeds is a small subsector of food manufacturing, with only 2% of persons employed, 1% of enterprises, 4% of value added at factor cost, 5% of production value and 6% of total turnover.

- The sector includes the manufacture of prepared feeds for farm animals and prepared pet foods. As in all other food manufacture subsectors, the majority of the enterprises (90%) are small (up to 19 persons), but the largest part of turnover (77%), value added (79%), production value (76%) and employment (63%) takes place in medium and large enterprises.
- Prepared animal feeds had 217 enterprises in 2018, from 208 in 2008. Although a small sector, it recorded a strong upward trend in its value added in 2013 and 2014 and the highest growth rate after fruits and vegetables during the period 2008-2018. Its turnover and production value also exhibited a strong average annual growth rate of 6.3% and 3.7% respectively.
- The sector cumulatively lost 22% of its employed persons during the same decade, recording an increase in 2017, reaching c. 2.1 th.in 2018. Labor productivity of prepared animal feeds, together with that of oils and fats, are among the highest of food manufacture, standing at EUR 49 th.in 2017.



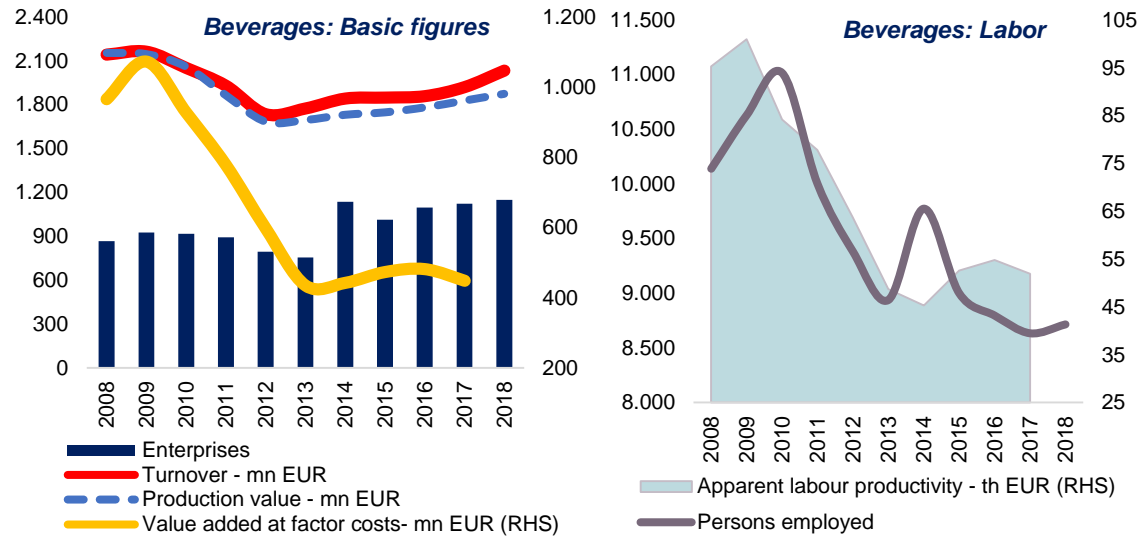
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Source: Eurostat, Structural business statistics, Data processing: Alpha Bank



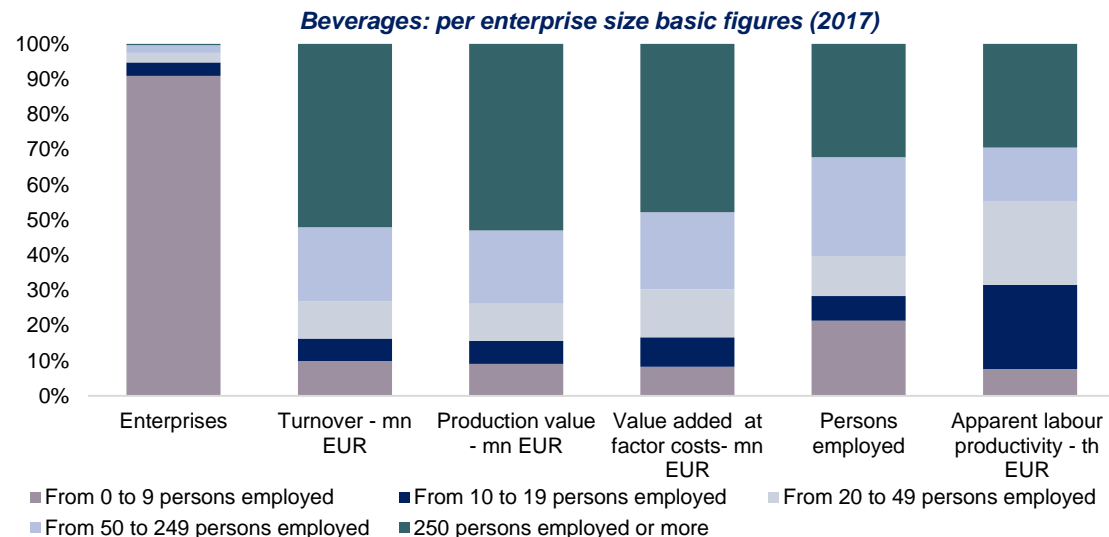
Market structure

- Prepared animal feeds top 10 enterprises in terms of turnover are Irida, Biomar Hellenic, Perseus Products of Special Diet, Zoonomi, Macedonian Industry of Animal Feeds, Crete Animal Feeds, Violife, DSM Nutritional Products Hellas, Spyridakis and Biozocat.
- These 10 firms account for 40% of total turnover.



Manufacture of beverages is a severely hit sector by the precedent economic crisis relative to subsectors in food manufacture, having cumulatively lost over half of its value added during 2008-2018.

- Beverages manufacture is a separate sector from food manufacture and includes alcoholic and non-alcoholic beverages and in particular the distilling, rectifying and blending of spirits, the manufacture of wine from grape, cider and other fruit wines, other non-distilled fermented beverages, beer, malt as well as the manufacture of soft drinks, the production of mineral waters and other bottled waters.
- Manufacture of beverages accounts for 4% of value added at factor costs and production value of total manufacturing, 3% of persons employed and turnover and 2% of enterprises.
- Although a sector with significant potential for Greek manufacturing, beverages suffered great losses during the previous economic crisis. Its value added fell sharply in 2010 and continued this downward trend until 2013 and still has not recovered. During 2008-2018, beverages cumulatively lost 54% of their value added and 14% of their employed persons. This parallel loss of both value added and employment led to a significant fall in labor productivity.
- Nevertheless, the enterprises of the sector increased by 1/3 during the same decade, reaching 1,150 in 2018. Out of these, the vast majority is small enterprises of up to 19 persons.



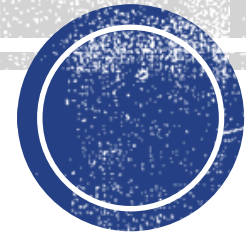
Market structure

- Wine from grape accounts for 53% of the sector's enterprises, whereas mineral waters and other bottled waters have the largest share of value added (42%) and persons employed (38%). Beer has 1/4 of the value added of the sector and 9% is due to the distilling, rectifying and blending of spirits.
- The 10 largest firms in terms of turnover are Coca-Cola 3E, Athinaiki Zythopoiia, Olympiaki Zythopoiia, Vikos, Pepsico-IBI, Pernod Ricard, Elliniki Zythopoiia Atalantis, Loux Marlafekas and Ellinika Kelaria Oionon Kourtakis.

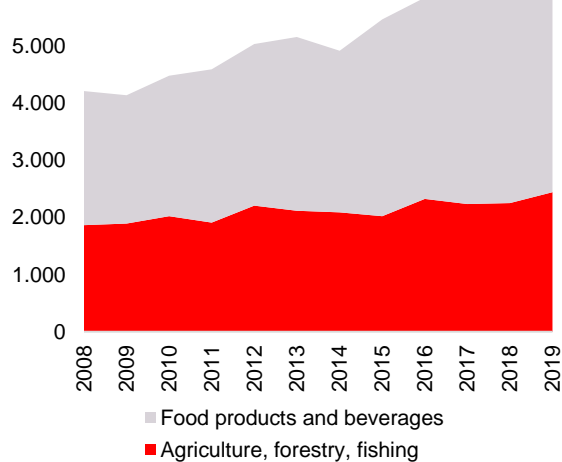
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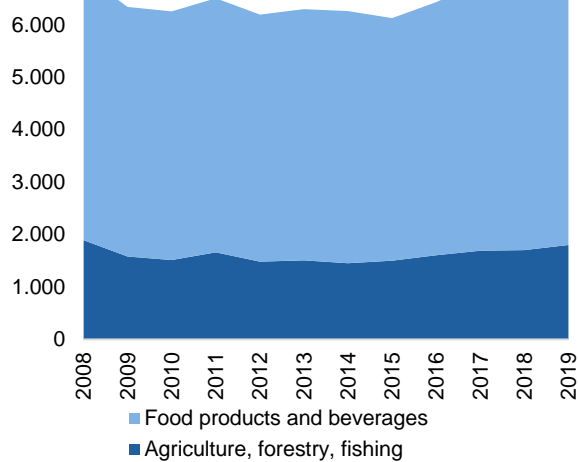
International trade, branding and extroversion of the agri-food products



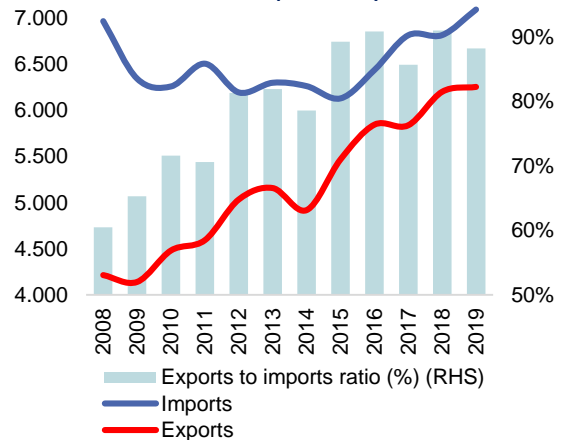
Agriculture, forestry, fishing, food products, beverages exports (mn EUR)*



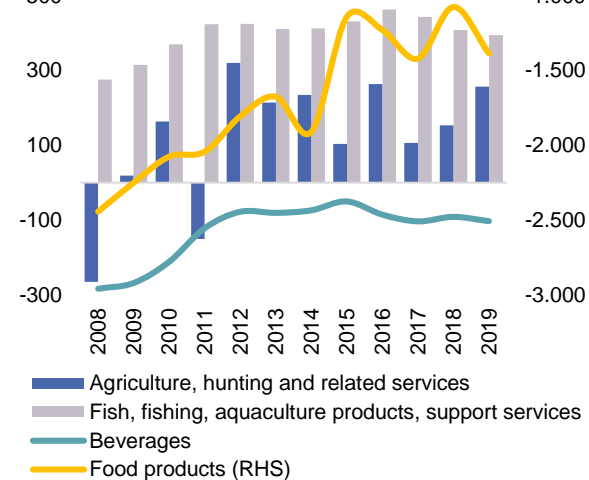
Agriculture, forestry, fishing, food products, beverages imports (mn EUR)*



Exports and imports of the agri-food sector (mn EUR)



Trade balance of agri-food products



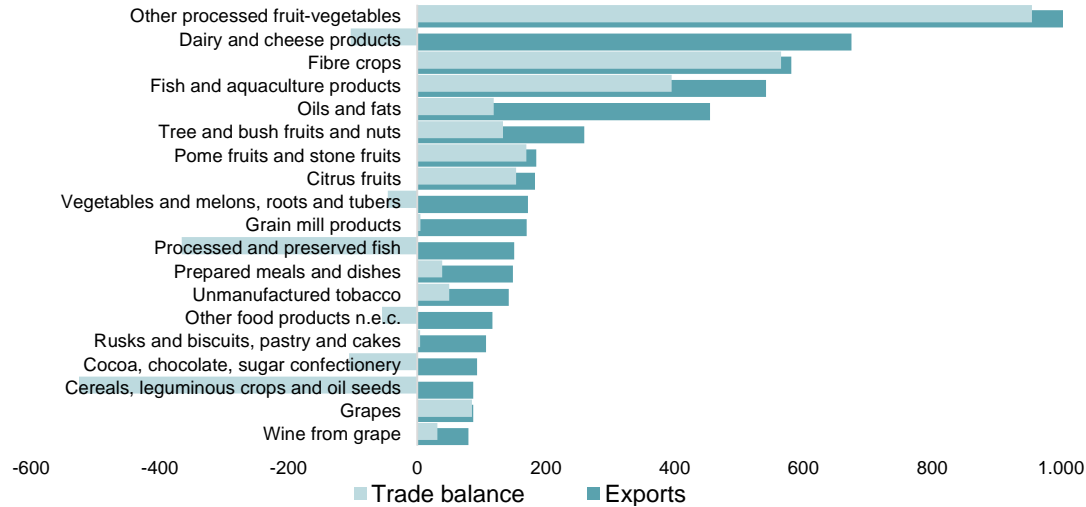
Exports of agri-food products have surged substantially (51%) over the decade 2009-2019, far more than the imports of the sector (12%), indicating that although there is still import dependence, the sector exhibits a considerable extroversion, mostly evident in aquaculture products.

- Agri-food products noted a substantial surge in exports during the period 2009-2019, accounting for 18% of total Greek exports in 2019.
- The exports of food and beverages manufacture, consisting the largest part of agri-food exports (94%, 2019), hiked by 70% during the period 2009-2019 and equally by 5.4% on average annually, significantly higher than those of agriculture, forestry and fishing (29% cumulatively).
- Out of the exported products of agriculture, forestry and fishing, the largest part (78%) is exports of agriculture products and related services and 22% is aquaculture products and service activities. The trade balance of agriculture and especially of fish and aquaculture products is positive, implying a strong exporting character.
- Imports of the agri-food sector annually rose on average by 1.1%, in the period 2009-2019 and cumulatively by 12%. Food and beverages imports increased by 11% and agriculture, forestry and fishing products by 14%.
- Food and beverages accounted for 75% (2019) of total imports of the agri-food sector, whereas agriculture, forestry and fishing for 25%.
- The trade deficit of the agri-food sector has decreased markedly by 62% cumulatively during the decade 2009-2019, ranging from EUR 2.7 bn in 2008 to EUR 840 mn in 2019.
- The ratio of exports to imports of the sector has increased substantially during the decade 2009-2019, ranging from 65% (2009) to 88% (2019), due to the higher growth rate of exports compared to that of imports.
- The relatively high exports to imports ratio implies that although Greece still relies on importing agri-food products from abroad, it has nevertheless managed to lessen this dependence over the years.

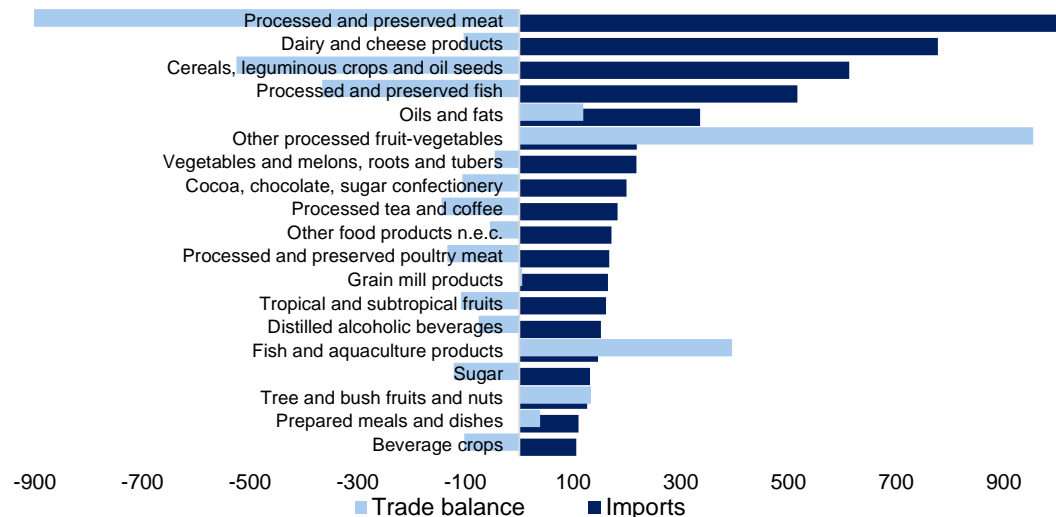
*The grouping of agriculture, forestry and fishing includes products of agriculture, hunting and related services, crop and animal production, hunting and related service activities, fish and other fishing products, aquaculture products and support services to fishing.

Source: Eurostat, Economic accounts for agriculture, Data processing: Alpha Bank

Top 20 exported agri-food products, (in mn EUR) in 2019, 4-digit level



Top 20 imported agri-food products, (in mn EUR) in 2019, 4-digit level

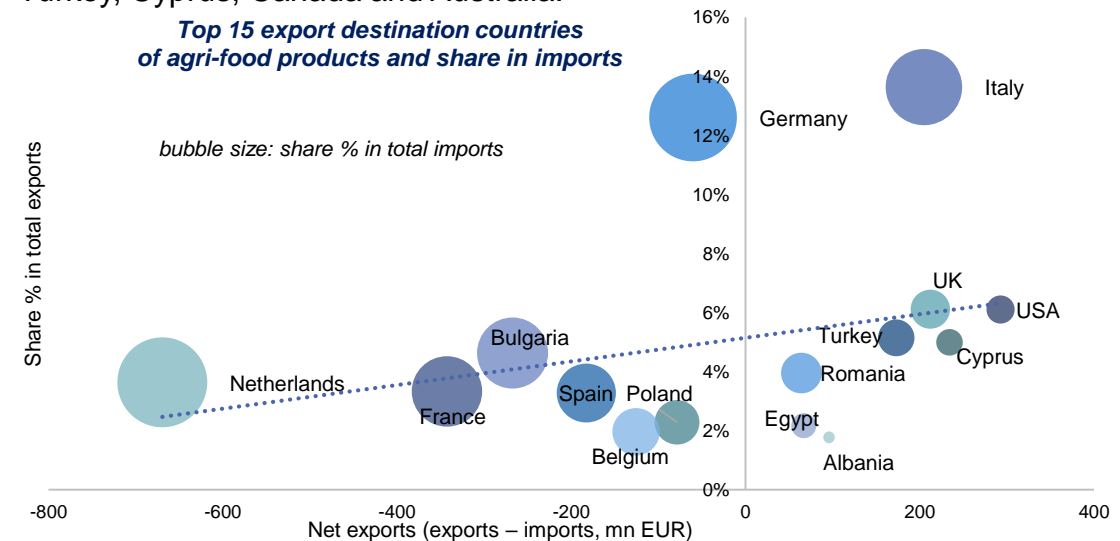


Source: Eurostat, Economic accounts for agriculture, Data processing: Alpha Bank

The top agri-food products trade partners in 2019 were Italy, Germany, Netherlands and France, while 70% of trade was carried out with EU-27 countries.

- Topping the list of exported agri-food products (2019) are processed fruits and vegetables, dairy and cheese products (although with a negative trade balance, implying higher imports than exports), fibre crops and fish, aquaculture products, oils and fats and various fruits and nuts.
- The top imported agri-food products are processed meat, dairy and cheese products, cereals, leguminous crops and oil seeds, processed and preserved fish, oils and fats (although the trade balance is positive, implying higher exports than imports) and other processed fruits and vegetables.
- Italy (14%), Germany (13%), UK (6%), USA (6%), Turkey, Cyprus and Bulgaria (each 5%) are amongst the top exporting destinations of Greek agri-food products. Netherlands (13%), Germany (12%), Italy (9%), France and Bulgaria (8%) are the top importing partners of Greece (2019). Amongst the countries with which Greece has a positive trade balance are Italy, UK, US, Turkey, Cyprus, Canada and Australia.

Top 15 export destination countries of agri-food products and share in imports



Logos to mark the Greek breakfast of the Hellenic Chamber of Hotels and the Greek certified products



The Mediterranean diet and the connection to the Greek diet

- Mediterranean diet, a culinary culture of countries overlooking the basin which counts an over a century history, has been declared by UNESCO as a “Cultural Heritage of Humanity”. In 2013, Greece, together with Cyprus, Croatia, Spain, Italy, Morocco and Portugal were inscribed on the Representative List of the Intangible Cultural Heritage of Humanity.
- The Mediterranean diet is a nutritional dietic model that consists of a high intake of olive oil, cereals, fresh or dried fruit and vegetables, a medium intake of fish and dairy and a low intake of meat and saturated fat. It also contains condiments and spices and a moderate intake of wine or infusions.
- The Mediterranean diet keeps intact its nutritional and culinary traditions, exhibiting a strong, local character which in addition to food, also encompasses social customs and interaction through communal meals.

The Greek breakfast

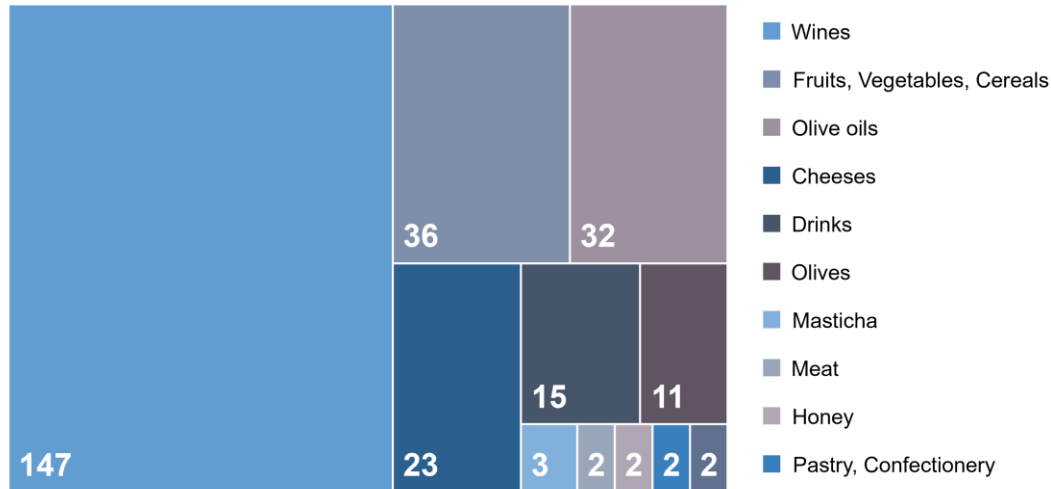
- The “Greek Breakfast” is an initiative of the Hellenic Chamber of Hotels which aims at combining the Mediterranean cuisine, gastronomical culture, local products and viands with the Greek hotel guest experience.
- The Greek breakfast has a high nutritional value and varies from place to place, promoting the local traditional specialties, tastes and products. The basis of the Greek breakfast includes local bread and cheese, olive oil, rusks, traditional yoghurt, honey, tahini, eggs, local pies, fresh fruit, soups.

A common vision for the future of the Greek agri-food products is a prerequisite in order to strengthen their brand name and extroversion, assure their quality and promote the Greek gastronomy abroad.

Branding and extroversion

- Product specific branding is part of the broader promotion and marketing procedures of a particular product or company by means of advertising and distinctive design, addressed to the domestic or foreign markets.
- The branding of a product contains packaging, design, logo, color schemes, social media, email marketing, advertising, messaging, slogan, websites and in general features that aim to accent its quality and differentiation.
- Examples of branding for the agri-food sector include labels for organic food, compostable packaging, exquisite characteristics of "boutique", delicatessen or premium quality products that link the quality of local production with exports and tourism.
- Branding can also refer to the identity of broadly recognizable products on a country level, such as the logo for Greek certified products. As such, branding is used to differentiate Greek food products, emphasise their quality and way of production, increase competition and assign value to how domestic and foreign customers perceive these products.
- “Made in Greece branding”, the Greek cuisine and the connection with the Mediterranean diet acts as an international identity of the Greek food products and consist a first step towards a broad acceptance of the product specific brands abroad. In this context, Greek food branding promotes the domestic products’ origin and identity and ensures that this identity is guaranteed, the quality checked, certified and standardised in a way that is immediately recognizable by the consumers.
- To ensure the further strengthening of the sector’s extroversion, it is also important to promote Greek food products through enhanced logistics networks and distribution channels and emphasise the connection between production and services like hotels, restaurants and tourism in general.

Greek PDO and PGI agri-food products per basic category



Logos of Protected Designation of Origin (PDO), Protected Geographical Indication (PGI) and Traditional Specialities Guaranteed (TSG)



Examples of Greek PDO and PGI products

- Famous examples of Greek PDO and PGI products are Feta, Kasserli, Ouzo, Tsikoudia/Tsipouro, Krasotiri Ko, Krokos Kozanis, Masticha of Chios, Fystiki Aeginas, Throumpa Thassou, Tomataki Santorinis, Avgotaracho Messolongiou, Fava Santorinis, Malvasia (wine), Patata Naxou, Koum Kouat of Corfu, Arnaki Elassonas, Exeretiko partheno eleolado Selino Kritis, Rodakina Naoussas, Kritiko paximadi, Samos (wine), Meli Elatis Menalou Vanilia, Elia Kalamatas, Melekouni, Manouri, Katiki Domokou.

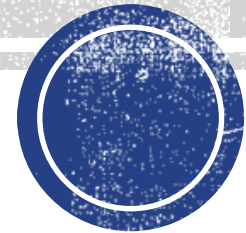
Local, traditional products or products of designation of origin and geographical indication, i.e. products with a special registration, consist a typical case of the effort to create a strong local identity.

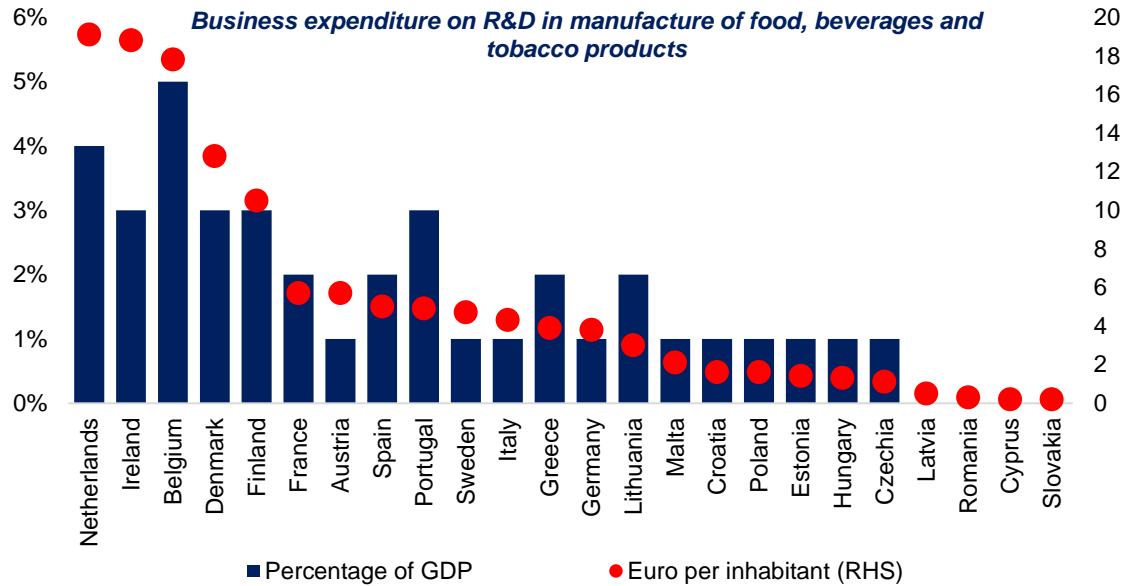
Quality schemes of protected designation and geographical Indication

- EU quality policy provides measures to help producers build on the high-quality reputation of domestic products and promote their unique characteristics, in order to sustain competitiveness, profitability, diversity, development and growth in the rural areas where they are produced and protect local knowledge, skills and jobs.
- A supportive to the above policy tool is the register of protected food names, with products being classified as Protected Designation of Origin (PDO) for the area of production, Protected Geographical Indication (PGI), regarding the origin of raw materials and Traditional Specialities Guaranteed (TSG), which highlight traditional aspects of the production.
- Products registered under one of the three schemes can be marked with the logo that identifies them. The registration supports the reputation of these products, reduces unfair competition and guides consumers so that they are not misled to distinguish genuine from non-genuine products.
- The first products registered in Greece were wines (1981). In 2020, Greece has registered 275 food and beverages, 112 PDO and 163 PGI. Out of those, 53% are wines (147 in total, 33 PDO and 114 PGI), 13% fruits, vegetables and cereals, 12% olive oils, 8% cheeses, 5% drinks and 4% olives and other meat, honey, pastry and confectionary products. Although Greece has not registered TSG products, together with Italy, France, Spain, Portugal and Germany are the six EU-28 member states which have c. 80% of the PGIs/PDOs/TSGs products.
- PDO, PGI and TSG products held an estimated sales value of EUR 77.15 bn in EU-28 in 2017 and EUR 1,195 mn in Greece. These products had an average value premium rate of 2.07 in 2017, down from 2.14 in 2010, compared to standard products without a registered label.
- Nearly 58% of Greek PGI and PDO products are sold domestically and less than 10% outside the EU. However, the promotion of the Mediterranean diet and strong branding could lead to the redistribution of these shares.



Technology, safety, research and innovation in the agri-food chain





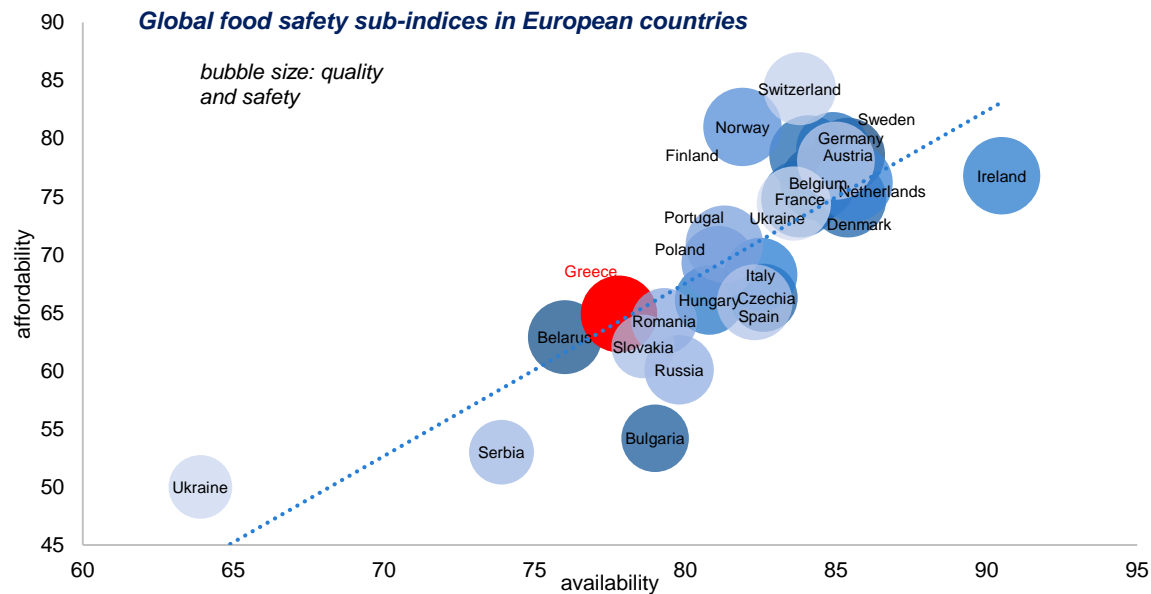
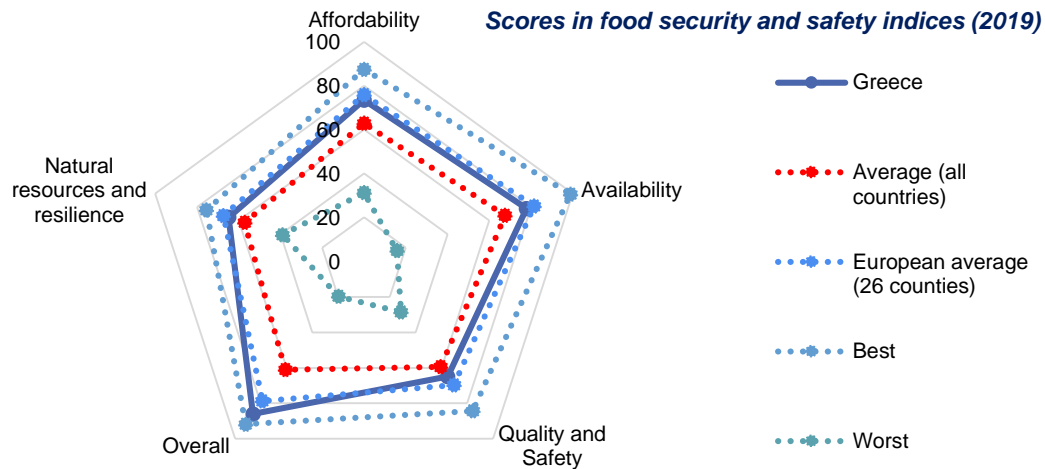
Business expenditure on R&D

- Business expenditure on R&D as a % of GDP varies among the EU-27 countries, ranging from zero in countries such as Cyprus, Latvia, Romania and Slovakia, to 5% in Belgium. In Greece, it stands at 2% (2017).
- As EUR per inhabitant, business R&D spending exhibits its highest value in the Netherlands (EUR 19.1), Ireland (EUR 18.8) and Belgium (EUR 17.8), with Greece (EUR 3.9) standing lower than the EU average (EUR 5.4).
- The EU agri-food sector in general exhibits a relatively low R&D private investment intensity (R&D private investment as a % of output) (2015: 0.27%) compared to other sectors (automobile: 5.5%, software: 10.6%, pharmaceutical: 13.1%).
- Growing costs relative to revenues, lack of finance and credit, low market demand for innovations and difficulties to get grants or subsidies for food and drink companies in order to invest and increase R&D expenditure, partly justify the relatively low R&D spending of the sector on a European level.

Source: Eurostat, Business expenditure on R&D, Data processing: Alpha Bank

The food industry during the last years is characterised by innovations oriented towards specialised customer needs and nutritional diets, but also by more transparency and increasing technology usage.

- Innovations are the result of scientific research and reorganisation of production processes, new ideas and methods applied in order to boost competitiveness.
- In the food industry, innovation and technologies are focusing on increasing the safety, conservation methods, packaging and healthiness of food and beverages, largely determined by digital transformation, climate change and health-focused consumers, in order to meet the challenges it faces.
- A FoodDrink Europe report (2018) identifies five main drivers of consumer expectations that lead food innovation in Europe: health, physical, pleasure, convenience and ethics. Consumers are more informed than ever before about the healthy food products.
- Innovation in the food sector is applied in packaging, methods of eliminating harmful ingredients, non-thermal and in general mild food processing, detection methods for food risk and security management, bio-active food ingredients, functional food and nutrigenomics, reduction of energy use or CO₂ footprint, increased material or water efficiency, recycle waste, improved/changed shape of goods/services.
- For example, the functional food, mostly applied in dairy products, beverages, cereal, snack food and fats, is made by a) adding bio-active food ingredients, such as antioxidants, fatty acids and micro-organisms, b) eliminating ingredients that, especially in certain types of intolerance, can be problematic for human health (e.g. lactose, gluten, sugar, salt, allergenic proteins), c) augmenting concentrations (micronutrients) and substituting ingredients (micro particles instead of fat).
- Innovations and new technological developments are also applied in farming, such as in new seed production, organic farming, pre-season farming using satellites and sensors for precision agriculture, e-commerce and food logistics and food waste management.

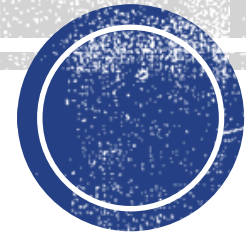


Note: Natural resources and resilience is not included in the Overall index.
 All countries include 113 countries. European average includes 26, shown in the second diagram
 Source: Economist, Intelligence Unit, Global Food Security Index, Data processing: Alpha Bank

Ranking 31st worldwide and 17th in Europe, food security is not a pressing issue for Greece, as Europe is the second strongest region, due to the effects of the Common Agricultural Policy, as well as the EU single market and the low threat level of climate change.

- The Global Food Security Index (GFSI) is a benchmarking tool, considering three core issues of food security: Affordability (40% weight in GFSI), Availability (44%) and Quality and Safety (16%), with different weights each. Although the index also explores the risk factor of Natural Resources and Resilience, it does not contribute to the overall score.
- The key aspects in food affordability include the change in average food costs, the proportion of population under the global poverty line, GDP per capita, agricultural import tariffs, the presence and quality of food safety net programmes and access to financing for farmers.
- In Europe, Ireland is the leading country and Ukraine ranks last.
- Greece ranks 1st worldwide in the presence and quality of food safety programmes but falls behind in GDP per capita.
- Availability of food measures the sufficiency of supply, public expenditure on R&D, agricultural infrastructure, volatility of agricultural production, political stability risk, corruption, urban absorption capacity and food loss.
- Availability marginally improved in 2019, mainly due to the improvement of political stability risk (+13.1) and urban absorption capacity (+7.5), even though volatility of agricultural production worsened (-1.4). Public expenditure on agricultural R&D and corruption are two major issues for Greece.
- Quality and safety assesses dietary diversity, nutritional standards, micronutrient availability, protein quality and food safety. Greece ranks 11th worldwide and 1st in nutritional standards and food safety.
- The key indicators for natural resources and resilience are exposure, water, land, oceans, sensitivity, adaptive capacity and demographic stresses. Greece ranks 28th worldwide and 19th in Europe, with high scores in adaptive capacity and demographic stresses, but low in every other aspect.
- Greece also exhibits 27.4% prevalence of obesity and 2.5% prevalence of undernourishment.

Institutional framework of the agri-food sector



The CAP, initially launched in 1962, ensures high standards of food security, safety and quality, focuses on the support of small and medium-sized family farms and the greater use of innovation and prioritizes sustainability linking support to environment, climate and food safety legislation.

The CAP 2021-2027 in the European Union

- The CAP 2021-2027 objectives are in line with the European Green Deal and comprise the following:
 - Ensure fair income to farmers
 - Increase competitiveness
 - Rebalance power in food chain
 - Climate change action
 - Environmental care
 - Preserve landscapes and biodiversity
 - Support generational renewal
 - Vibrant rural areas
 - Protect food and health quality
- In May 2020, in the context of the European Recovery Plan to battle economic downturn due to the coronavirus pandemic, the total CAP 2021-2027 funding (Direct Payments and Rural Development Programmes) was reinforced to EUR 391.4 bn from EUR 365 bn in the 2018 proposal, lower than CAP 2014-2020, due to Brexit, emigration and refugee issues, internal and external security, demographics and climate change challenges.
- Direct Payments (including market-related expenditures) will amount to EUR 290.7 bn, higher by EUR 4.5 bn than the 2018 proposal, aiming at supporting and stabilising basic agricultural income based on the farmland size and at dealing with difficult market situations.
- Direct Payments are mandatory (basic payment, green payment, young farmers scheme) and voluntary (redistributive payment, payments for areas of natural constraint, coupled support, small farmers scheme).
- Rural Development Programmes include measures on organic farming, farm business and development, physical assets investments, agri-environment-climate, areas facing natural constraints, restoring agricultural production

potential damaged by natural disasters and catastrophic events and introduction of appropriate preventive actions, animal welfare, cooperation, basic services and village renewal, knowledge transfer and information actions, risk management, quality schemes and advisory services, farm management and farm relief services.

- Rural Development Programmes will include 1) EUR 84.3 bn, higher by EUR 5.5 bn than the 2018 proposal, aiming at funding activities based on specific needs of the member-states and 2) EUR 16.5 bn (under Next Generation-EU), aiming at supporting rural areas in making the necessary structural changes in line with the European Green Deal, as rural areas will have a key role to play in green transition.
- Member states will have the option to transfer CAP allocations as follows:
 - Up to 15% between direct payments and rural development to adapt the policy to their farming sector's priorities
 - Up to 15% to rural development only for environmental/climate objectives
 - 2% for new farmers from direct payments to rural development

The CAP 2021-2027 in Greece

- Total funding will amount to EUR 18.3 bn.
- Direct Payments will amount to EUR 14.2 bn, the 6th highest in EU-27 after France, Germany, Spain, Italy, Poland.
- Rural Development Programmes will amount to EUR 3.6 bn, the 7th highest in EU-27 after Poland, Italy, France, Spain, Germany, Romania.
- The Rural Development Programmes include exclusive support for the Aegean islands as they are subject to severe geographic and natural constraints and limited utilised agricultural area, rendering their topography and climate limiting factors for agricultural production.

Sustainability awareness in environmental issues related to production and consumption in the agri-food sector increased during the last years, with the EU-28 developing a Bioeconomy Strategy (2012 updated in 2017) and the European Commission presenting the Farm to Fork Strategy in 2020.

Farm to Fork Strategy

- The Farm to Fork strategy is a cornerstone of the European Green Deal, which paves the way for Europe to become the first climate-neutral continent by 2050.
- The strategy is characterized by the key role it gives to food system Research and Innovation, enabling the necessary transitions so that food systems become sustainable along the whole food value chain. A neutral or positive impact to the environment and climate change, which will ensure food security and make healthy nutrition an easy choice for Europeans, is a requirement of the strategy.
- The targets set by this strategy are the following:
 - Chemical pesticides use and risk reduction by 50% by 2030 and more hazardous pesticides use reduction by 50% by 2030.
 - Nutrients (especially nitrogen and phosphorus) losses reduction by at least 50% by 2030 and fertilizer use reduction by at least 20%, keeping soil fertility unchanged.
 - Reduction by 50% by 2030 of antimicrobials sales for farmed animals and aquaculture, since antimicrobial resistance related to their use leads to c. 33,000 deaths in the European Union each year.
 - Further development of organic farming, an environmentally friendly practice, to 25% of total farmland by 2030.
- Farm to Fork strategy will be supported by regulatory and non-regulatory initiatives, with the key tools of Common Agricultural Policy and Common Fisheries Policy.

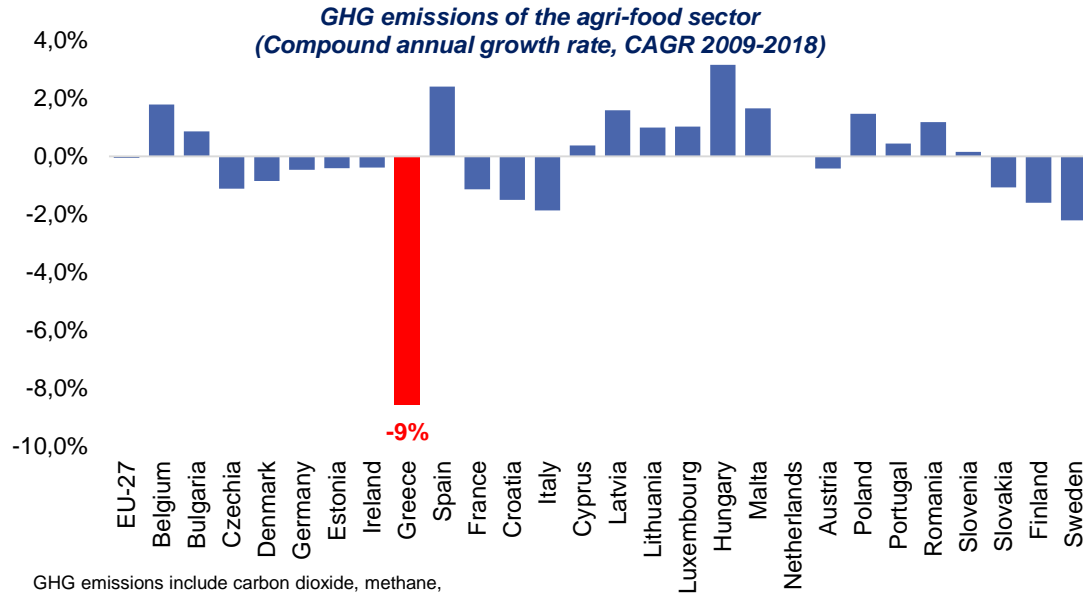
Bioeconomy Strategy

- According to European Commission definition, bioeconomy includes land and marine ecosystems, all primary production sectors using and producing biological resources (agriculture, forestry, fisheries, aquaculture) and all economic and industrial sectors using biological resources and processes to produce food, feed, bio-based products energy and services.
- The contribution of bioeconomy in the EU economy was 4.2% in 2015 in total gross value added and 8.2% (around 18 mn jobs) in total employment.
- The EU agri-food sector accounted for 66.7% of the bioeconomy's gross value added, 77.2% of its employment and 67.2% of its turnover (2015).
- Bioeconomy strategy's aim is to promote innovation and resource efficiency in a competitive society, combining food security with sustainable renewable resources and environmentally protective industrial use.
- The European Union supports the bioeconomy by funding dedicated to research and innovation in the Horizon 2020 (2014-2020) Program, under investments of EUR 3.85 bn and in the Horizon Europe (2021-2027), through a proposed EUR 10 bn (including bioeconomy, food and natural resources).
- France, Germany, Italy, Spain, Finland, Ireland and Latvia have already developed a dedicated bioeconomy strategy; whereas Austria, Netherlands, Hungary, Estonia and Lithuania are in the process of developing one.

In Greece

- There is no dedicated bioeconomy strategy, but only national related strategies, such as the National Climate Change Adaptation Strategy, CAP's Rural Development Program, the National Strategic Framework for Research and Innovation and the Draft National Energy and Climate Plan.





Greenhouse gas (GHG) emissions

- GHG emissions of the agri-food sector accounted for 9.8% in 2018 of all economic activities' in the EU-27, a share that remains the same since 1990. In Greece, the respective share stands at 3.3% (2018).
- In 2018, 56% of the agri-food sector's GHG emissions in Greece originated from agriculture, forestry and fishing, while 44% from manufacture of food products, beverages, tobacco products.
- In the EU-27, the agri-food sector's GHG emissions marginally decreased by 0.1% in the period 2009-2018, with Greece exhibiting the largest decrease (-9%). This reduction is mainly attributed to the fall of GHG emissions in agriculture, forestry and fishing by 12.1%, since the decrease of food and beverages manufacture is negligible (-0.8%).
- The share of agriculture in emissions per source sector in Greece was equal to 8% in 2018 (10% in the EU-27), 4% stemming from livestock, 3% from managed agricultural soils and 1% from manure management..

Source: Eurostat, Environmental Statistics and Accounts, Data processing: Alpha Bank

Greenhouse gases from agriculture in Greece is the third largest source sector, after fuel combustion in energy industries and transport and industrial processes and product use.

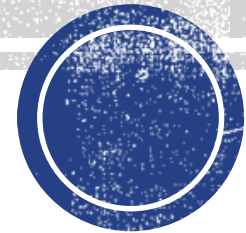
Product Environmental Footprint (PEF)

- The European Union developed the PEF method in 2013, aiming at supporting the environmentally friendly product development, which render it a significant tool for the implementation of circular economy actions.
- The PEF method assesses 16 impacts of products to the environment, ranging from the extraction of raw materials to their supply chains, based on standards and methodologies such as the ISO standardisation.
- The EU also developed the PEFMED method, combining the PEF with socio-economic indicators, aiming at the creation of a Sustainable Business Plan in order to reduce the products' and supply chains' environmental and socio-economic impact.
- The PEFMED method was tested in 6 countries of the Mediterranean region (Greece, Italy, Slovenia, Spain, France, Portugal) during November 2016 up to July 2019, in 6 products (cheese, cured meat, olive oil, wine, feed, bottled water), 9 companies and 56 companies-suppliers.
- In Greece, this method was tested in Delta Foods (Vivartia Group), leader in Greek dairy sector, at the Ellassona Dairy factory for the production of the PDO feta cheese. The footprint test showed that in the contribution of each life cycle phase to the overall environment and climate change negative impact, raw milk supply accounted for 90% and 80% respectively.

Energy use

- The energy used in 2018 in agriculture, forestry and food, beverages, tobacco industry was equal to 4.7% (1.7% and 3%, respectively) of total final energy consumption of the Greek economy, lower than 5.8% in EU-27.
- Renewable energy produced in 2018 in agriculture and forestry in Greece was 31.9% (6% and 25.9%, respectively) of total renewable energy production, lower than 53.5% in EU-27 (12.1% and 41.4%, respectively).

Policy recommendations and SWOT analysis of the agri-food sector



In an effort to address the structural issues of the sector, actions should be placed upon the application of technological advances in the industry, by also focusing on innovation, the organised promotion of the Greek products and food gastronomy abroad under an established brand name, and the collaboration of the industry with research and universities in order to update skills and revitalise the production processes.

Innovation, new technologies and environmentally friendly techniques across the whole agri-food chain are a necessary condition for sustainable production

- Increase investments for mechanisation and modernisation of production, apply research findings in the production process and incorporate new technologies in agriculture.
- Food innovation can be used in food production and consumption in order to support the transformation needed to achieve climate goals.
- Introduce new technologies which respect the environment, such as environmentally friendly packaging, and apply innovations in the production and distribution processes of food manufacture, such as bio-active food ingredients.
- Implement anti-corrosion measures and promote the rational use of water.
- Establish food traceability and elimination of fraudulent products measures.

Research, skills development and connection of the agri-food sector to tertiary education

- Stronger research activity in universities and communication with other research institutions and the industry are necessary.
- A national collaboration of universities and companies in the agri-food sector could create a unified programme for working farmers to start, continue or complete their training and education, discover new methods and technologies, develop an entrepreneurial spirit, form groups for collaborative production and create strong links with key players in the industry.

Establishment of a brand name internationally identifiable for the agri-food sector

- Shaping and promoting the identity of Greek food and beverage products under an established brand name that distinguishes them from those of other countries positively impacts their exporting orientation and position in the international markets.
- Further endorse quality products, tastes and links of the Greek to the Mediterranean diet, by also strongly promoting the PDO and PGI products abroad.

Stronger collaborations of the key players, cost efficiency and production expansion

- Expand agricultural production and efficiency via the upsize of the average farm and market-based production schemes, so as to create less dependency on imports.
- An operations network starting before the farm and ending at the consumer could be connected with supply chains (logistics) which allow cost reduction, improvement of product quality and increase market penetration.
- Innovative procedures in the agri-food sector could be further applied in marketing and branding, security and quality, reduction of production costs and meeting the special needs of consumers.
- Create specific land map and crop zones, by identifying what is cultivated and produced, where and for which purpose.
- Develop stronger relationships between food industry key players and use domestically produced agricultural products in the food and beverages industry, through collaborations such as contract farming.



Strengths

- Superior quality of foods, linked to authentic local products.
- Strong link of the Greek to the Mediterranean diet, an UNESCO Cultural Heritage of Humanity.
- Diverse soil and good climate conditions, allowing for a variety of products.
- A multitude of university departments that offer quality education.
- High amount of CAP funding in the agriculture sector.
- Strong presence of food and beverages manufacturing, with a dynamic exporting character.
- High food security and food safety, with Greece ranking 31st worldwide and 17th in Europe.
- Large number of food and beverages PDOs and PGIs (275), rendering Greece one of the six EU-28 member states having c. 80% of PGIs and PDOs products.

Opportunities

- Increase levels of self-sufficiency and exports of PDOs and PGIs.
- Establishment of a strong identity and brand name for Greek products in the global market, with links to the Mediterranean diet.
- Implementation of new technologies in the agri-food sector (such as in packaging, logistics biotechnology/DNA technology, security/safety).
- Development of strong connections between companies and institutions within the supply chain, through clusters' formation and the cooperation and synergies of farmers, manufacturers and trade companies.
- Connection of research with all stages of production.
- Further strengthening and support of export orientation via marketing and distribution channels.
- Extensive use of the Product Environmental Footprint in more companies and products in the whole supply chain.

Weaknesses

- Aging farming population and limited entrepreneurial activity of farmers.
- Agriculture high production cost and low productivity and production.
- Small size and high fragmentation of land, with limited use of new technologies.
- Lack of substantial contract farming and connection of agriculture to manufacture.
- Limited innovation and technology integration and lack of strategic planning and investments towards R&D.
- Insufficient communication, coordination and collaboration between companies, universities and research institutions.
- Non-existing long-term agri-food policy and insufficient regulatory framework for promoting innovation and technology.

Threats

- Low prices of foreign agri-food products which can drive up competition with domestic production.
- Fluctuation and higher prices of raw materials impede on low cost production.
- Crises that distract from long standing problems, the solution to which could prove beneficial in multiple disciplines.
- Environmental footprint and/or natural disasters due to climate change, pollution and the disruption of ecosystems that have severe effects on agricultural production.
- COVID-19 pandemic and its implications on demand and supply and the creation of potential supply shortages due to the subsequent economic recession.

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Databases

- Economist, Intelligence Unit, Global Food Security Index
- Hellenic Statistical Authority, ELSTAT
- European Commission e-Ambrosia
- Eurostat
 - Business expenditure on R&D
 - Economic accounts for agriculture
 - Environmental Statistics and Accounts
 - Final consumption expenditure of households
 - HICP
 - National accounts
 - Structural business statistics
- Food and Agriculture Organization of the United Nations (FAO)
- Hellenic Chamber of Hotels

Websites

- <http://www.minagric.gr/>
- <http://www.minagric.gr/index.php/el/for-farmer-2/2012-02-02-07-52-07/ellinikaproionta>
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Panayotis Kapopoulos, Chief Economist, PhD
panayotis.kapopoulos@alpha.gr

Foteini Thomaidou, Economist, PhD
210-5178966, foteini.thomaidou@alpha.gr

Spyridoula Kati, Economist, MSc
210-5178968, spyridoula.kati@alpha.gr

Foteini Passa, Agronomist, BSc
foteini.passa@alpha.gr

ALPHA BANK ECONOMIC RESEARCH AND ANALYSIS
11, Sophocleous Street
GR 105 59 Athens
T +30 210 517 8963, F +30 210 348 7873
Email: AlphaBankEconomicResearch@alpha.gr
Web site: <http://www.alpha.gr>

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