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# Project final report

## COMPETE

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**FINAL PUBLISHABLE SUMMARY REPORT**

## 1. EXECUTIVE SUMMARY

Competitiveness is one of the most important topics for research and publication in the field of business and management in the world today. Global and national developments such as globalisation, an increase of competition on the world and EU markets, changes in national (CAP) and international (WTO) agricultural and trade policies, economic crises, e.g. the food price hikes of 2008, and changing consumer preferences, have all created new requirements for the agri-food sector and policy makers. In particular, the competitiveness of the agricultural sector, which has in general been largely protected in developed countries, is central, given the potential consequences if protection is reduced. Correspondingly, competitiveness finds its expression in the formulation of policy objectives. In the Lisbon Agenda, the EU stated the very ambitious goal of making the EU 'the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion' (EC, 2000). This goal was further developed within the EUROPE 2010 framework (COM, 2010) where policy objectives and instruments were formulated that contribute to the improvement of competitiveness, like fostering research and development and improving the education level of young people.

The **general aim** of the COMPETE project is to assess competitiveness of the European agri-food supply chain and gain a more comprehensive view on the different elements, which contribute to its competitiveness, in order to provide better targeted and evidence based policies on international, the EU as well as on the domestic level.

The project work was focused on 1) conception and indicators of competitiveness, 2) the determinants of competitiveness, 3) policy recommendations and dissemination. In the first part a comprehensive definition of competitiveness was developed by integrating the findings from selected theoretical micro and macro approaches. Within this framework the conventional procedure of concentrating on one industry only was extended, and it was analysed in detail how conditions in up- and downstream markets are transmitted along the value chain and how they affect individual stages and firms within the value chain. This framework constitutes the basis for the empirical analysis, where the EU position on world markets will be discussed in relation to that of major competitors (WP2-WP4).

The second part deals with selected determinants of competitiveness (WP5-WP9). These include policy intervention and business environment, productivity in agriculture and food processing, the functioning of domestic and international markets, the choice of governance structures as well as innovative activities in food processing.

The third part provides a coherent synthesis of the research findings and a comprehensive assessment of EU competitiveness (WP10), which allows deducing consistent and congruent policy recommendations. The main target groups were engaged in the process of creation of the policy recommendations as well a wide and deep dissemination of the project's results.

In the COMPETE project, the micro and the macro perspective was merged. The results of the project attend to deeper understanding of competitiveness of firms within the chain with regard to the national and the international context and it is crucial for the better targeted and

evidence-based policies in order to improve the sector performance on national and international level.

## 2. SUMMARY DESCRIPTION OF PROJECT CONTEXT AND OBJECTIVES

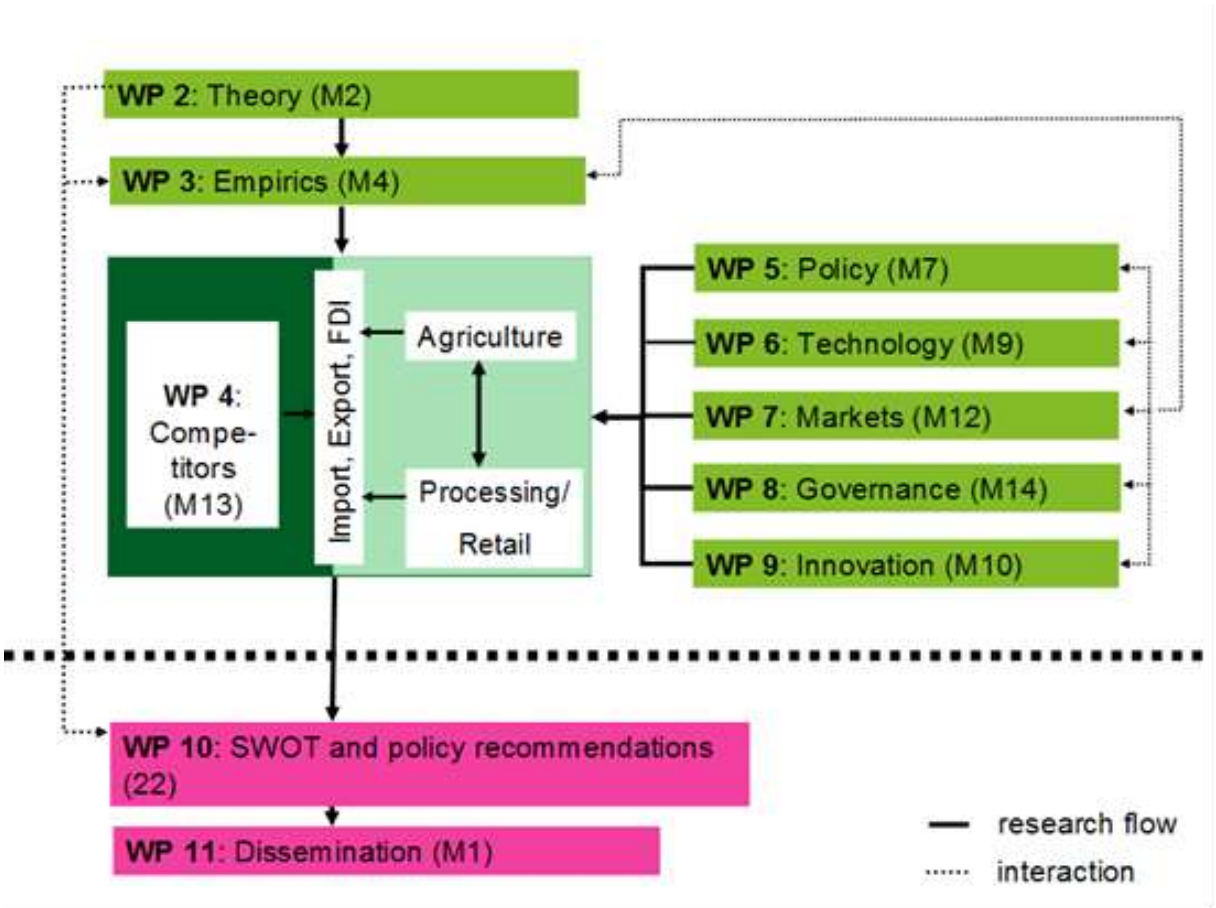
### 1.1. The general objectives of the project

The **general aim of COMPETE** is to assess competitiveness of the European agri-food supply chain to gain a more comprehensive view on the different elements which contribute to its competitiveness in order to provide better targeted and evidence based policies on the EU as well as on the domestic level.

The COMPETE project delivers a coherent and innovative evaluation of the competitiveness of European food chains by integrating various new approaches. Based on these, an appropriate, coherent, and consistent set of policy recommendations can be deduced from the research results for the purpose of improving competitiveness and promoting a knowledge-based bio-economy in Europe.

Throughout the course of the project a dissemination strategy will be implemented to ensure that the results of the project are recognized appropriately and made available to a wide community of users such as farmers, farm advisory systems, policy makers, social actors, rural businesses, etc.

**Flow chart: Structure of the project**



### 1.2. **Specific objectives of competitiveness analyses**

The Project officially started on **October 1, 2012**.

In order to achieve the main objective, several sub-goals are defined below. They are related to the measurement and empirical evidence of competitiveness, its determinants, and the dissemination of results.

The specific goals are:

- to provide a conceptual framework for assessment of product chain competitiveness based on the existing theoretical approaches. In this context criteria and indicators for comparative analysis of competitiveness will be identified.
- to analyse international trade patterns by using indicators of competitiveness for the EU and its main trade partners and to assess the stability and development of trade competitiveness of the EU countries in various market segments and major regions.
- to assess the competitive positions of EU competitors, including the strengths and weaknesses of the value chains in major trade countries.
- to identify the role of governments and business environment as catalysts for achieving competitive positions on world markets.
- to access the exploitation of economies of scale and production possibilities (technical efficiency) in agriculture and food processing and to identify the relationships between productivity in the two stages of the food chains.
- to assess the functioning of markets in selected value chains including the evaluation of supply chains for quality products (e.g. organic, PDO, PGI, TSG) in the EU and to quantify the degree of market distortions.
- to study governance structures that coordinate vertical transactions in agri-food supply chains and relationships between product quality, export and food sector performance as well as productivity growth.
- to quantify the role of company and public R&D for innovation development and adoption,
- to investigate how public policies have influenced innovative activities in food chains, and to understand the link between innovation and general competitive strategies
- to present a coherent syntheses of the research finding and to provide a comprehensive assessment of EU competitiveness which allow deducing consistent and congruent policy recommendations.
- to stimulate dissemination of project results by workshops and other forms of personal interaction with business representatives including the Commission.

Pursuing these objectives will result in a comprehensive analysis of competitiveness of firms in the food chain. Moreover, different stages will be covered so that analysis and results for raw materials, as well as products with different degrees of processing will be presented

## 3. A DESCRIPTION OF THE MAIN SCIENTIFIC RESULTS

Over the three-year duration of the project, research on **competitiveness and performance of** EU agri-food supply chains resulted in the following main achievements.

In the *first period of the project*, the members of the COMPETE Consortium provided a conceptual framework for assessment of product chain competitiveness based on existing theoretical approaches and to identify criteria and indicators for comparative analysis of competiveness. They carried-out analyses of the EU agri-food trade pattern as well as on the competitive position of EU major competitors on world agri-food markets. The Consortium provided also a comparative investigation of agricultural production technology in EU countries. Moreover, the project team analysed the business environment in EU countries and identified differences in innovative activities between agri-food companies in different sectors and regions. Finally, in the first period the consortium provided insights on how policies affect knowledge creation and innovation in agri-food supply chains.

During the *second reporting period* the COMPETE consortium mainly built on the work accomplished in the first reporting period by analysing in detail the factors that influence the performance of the EU on international markets. In particular, the EU agricultural and trade policies and possible distortions regarding the functioning of agri-food value chain were reviewed. Partners analysed the efficiency and productivity of the food processing industry in EU member countries for selected supply chains and identified the sources of inefficiencies. Also internal market functioning was assessed and the extent of market power identified. Moreover, the governance structures and determinants of vertical coordination in selected supply chains were analysed. Partners studied the link between innovation and competitive strategies, the relationship between process as well as product innovation and performance and the effect of public policies on innovative activities in food chains. Finally the strength, weaknesses, opportunities and threats of EU food chains were identified and policy recommendations were deduced.

Throughout the course of the project different dissemination activities were implemented to ensure that the results of the project are recognized appropriately and made available to a wide community of users such as farmers, farm advisory systems, policy makers, social actors, rural businesses, etc.

In the following key scientific findings of the project, accordingly to its structure, are presented.

**Conceptual framework and recent developments** (WP2)

The foundation for the *conceptual framework* was laid by creating an *overview over recent developments on world agricultural markets*, as well as on semi-finished and processed food products. A literature review exposed that in the last 20 years, the EU food chain's competitiveness has been strongly influenced by trends originating both domestically and internationally. These have positive and negative impact on the future competitiveness of all elements of the supply chain in the short and the long run. The most important factors were diet changes, new technologies and an increasing level of technology and mechanization of agricultural production, growing price volatility, expansion of private food standards accompanied by diversification of food products, proliferation of public food quality standards and safety regulations, public demand for traceability and transparency, higher

openness of agri-food markets, and finally increasing demand of consumers for organic food products.

*Diet changes* due to the rise of incomes in developing countries and growing urban population) towards higher-valued food products are likely to favour the EU's well developed food processing industry, but might lead to import substitution through the expansion of food processing capacities by emerging countries creating new competitors (especially from the BRICS (Brazil, Russia, India, China, and South Africa).

*New ground-breaking technologies and an increasing level of technology* and mechanization of agricultural production are likely to benefit the EU's food supply chain due to its relatively good accessibility to necessary capital. Considering this trend, agricultural employment is expected to further decrease, especially in developed countries.

The recently observed *growth in price volatility* may enhance the relative competitiveness of the EU, since EU producers and consumers might be less affected by an increase in the price risk of agricultural production, since they have better access to bank loans, than competitors from developing countries.

Public demand for *traceability and transparency* across the supply chain, as a consequence of food scares and growing consumer awareness, might increase the competitiveness of the EU due to good institutional as well as infrastructural conditions for effective logistics and tighter vertical integration and co-ordination. Policy actions which promoted the proliferation of *public food quality standards and safety regulations* like the EU quality schemes, e.g. PDO/PGI certification, are most likely to create import barriers and restricted niche markets with high and sometimes unrealisable food quality requirements for foreign competitors, thus favouring domestic (EU) and local enterprises.

The expansion of *private food standards* as private sector initiative to gain consumer trust in combination with R&D are fostering the diversification of food products, which allows enterprises with the essential research and quality control infrastructure, as well as the necessary amount of market power (mainly large EU and US conglomerates), to create global brands and use *branding* to increase their value added.

Trade liberalisation in form of bilateral and multilateral agreements created a *higher openness of agri-food markets* and will probably increase agricultural exports from competitive EU enterprises, but might lead to domestic market share losses for uncompetitive EU food companies to non-EU players (especially from the BRICS).

The increasing demand of consumers for *organic food products* might favour competitors from developing countries, since the production is less technology based and more cost-saving for them, allowing them to increase their exports on the European Single Market, if they are able to meet the quality requirements and have reasonable trade access.

These major trends were combined with a *review of relevant trade and related theories* to develop a coherent *concept of competitiveness of product chain and its determinants*. A review of the seminal work of, amongst others, Porter, Krugman, Barney, the World Economic Forum, and Gereffi was conducted. In addition, applications of theories to the European agri-food sectors were assessed. It was concluded that Porter's (national) approach is limited when applied to understanding the competitiveness of European agri-food industries. Specifically, within the context of the agri-food system, it fails to capture the effects of the CAP on competitiveness and the interactions between the sector and the environment. Following Resource Based Theory (RBT) and related empirical studies, the importance of firm effects is stressed. RBT assumes that firms should develop 'distinctive'

and ‘superior’ (tangible and intangible) resources and capabilities, which are not easily replicated, to achieve a sustained competitive advantage.

Most of the literature regarding agri-food industry competitiveness draws largely on trade, productivity and value added indicators and focuses on the assessment of competitiveness at the farm, agricultural sector or food industry levels, with very few studies adopting an integrated supply chain approach. In consequence, there is little research on the identification of determinants and metrics that characterise agri-food supply chain competitiveness per se. Moreover, there is little (if any) work on what defines and how to measure ‘sustainable competitiveness’, with most studies ignoring any social and environmental considerations.

The synthesis of the findings demonstrated that competitiveness is a relative and dynamic concept which can be assessed at various levels (e.g., country, region, industry, supply chain and firm). Given its complexity, it is difficult to encompass it in a single, universally accepted definition. The indicators should be ‘comprehensive’, ‘illuminating’, verifiable’, ‘useable’, and ‘comparable’. They also should be applicable to at least five groups of users: enterprises, policy makers, quality assurance agents, civil society, and academics/research community.

The developed ***conceptual framework*** covers five areas: sphere of enterprises, policy context, consumers, natural environment, and the relationships between the agents and domains. Imbedded in this framework the agri-food trade, policy, production technology, and market functioning, as well as the governance of agri-food value chains and innovation activities in the agri-food industry were investigated as the main determinants of competitiveness.

**Trade position (WP3)**

The assessment of the EU’s trade position showed that *agri-food exports and imports grew* considerably in absolute value over the analysed period, although the market shares on the world agri-food markets of 14 EU countries and EU-27 as a whole have declined. Disproportional fast growth of agri-food trade in emerging and developing countries was the cause of the *market share drop* on export markets of the EU from 47.3% to 41.3% from 2000 to 2011. The EU countries with increasing market share are mainly among the new member states.

The structure of EU agri-food trade barely changed. The *EU primarily exports processed foods* to a wide variety of countries in the world and is a net-importer of bulk and horticultural products. Fortunately, revealed comparative advantages on export markets are more enduring for these processed products. The EU-15 countries, EU members before the EU enlargement in 2004, are characterized by a larger numbers of agri-food products with more *stable export competitiveness advantages* during 2001-2011 than the EU-12, new member states after 2004.

In the EU-27 member states an important component of agri-food trade is successful *quality competition* with trade surplus (export is greater than import), which is achieved at higher export than import price for similar product. The second most important component is successful *price competition* with trade surplus, but at lower export than import price for similar product.

The *increased proportion of intra-industry trade* (IIT) or similar trade in the matched two-way agri-food trade of the EU-27 member states is consistent with economic integration and economic growth. High vertical IIT increased for most of the EU-27 member states. Only the one-way export share or only the one-way import share was less important in the EU-27 member states agri-food trade structures.

The *most important export markets* of the EU-27 are the USA, Russia, and China. However, the share of EU export to the USA decreased in the last year. In contrast export values as well as shares of EU-27 export to Russia and China has grown. The significance of the Chinese market for the European agri-food products is growing steadily.

In general, the agri-food export competitiveness of the EU-27 is driven by a few successful and longstanding member states, i.e. Germany and the Netherlands, which reveal significant *long lasting export advantages* for several differentiated product groups on the global markets.

The *major EU competitors* on global and domestic agri-food markets had to be determined to be able to evaluate EU's trade position. As the main competitors the USA, Canada, Australia, New Zealand, and Argentina, as well as fast emerges ones such as China, Russia, and Brazil, which will most likely have a strong effect on the export trade position as well as competition on EU import markets and thus the competitiveness of the EU agri-food trade in the near future, were identified.

Alongside the analysis of international trade, the project also examined the market potential for products produced and processed according to the EU quality schemes. A review of studies and practices on the adoption and diffusion of the EU quality schemes, as well as their impact on the value added, shows that *organic food and PDO, PGI, and TSG products in EU created a fast growing market and have vast potential for further growth*. In particular, some PDO and PGI products have gained strong market positions. PGI foods are mostly present in the premium price segment of EU countries. In some countries, certain traditional PDO products have reached large market shares. For example, PDO cheese and meat products accounted for 52% and 39.3%, respectively, of sales for consumption in Italy in 2011. However, in less developed EU countries such as Romania, the premium price for organic products (as well as PDO, PGI) restricts demand due to consumers' lower purchasing power. This can explain why most sales take place in countries with a higher income per capita, e.g. the UK, Italy, and Germany. However, not only can income represent an important factor for the success of organic (PDO, PGI) products, but also the level of education among the population, as well as their awareness for organic (as well as PDO and PGI) products. As consumers become more educated and informed about food issues, they are more likely inclined to buy organic products, because they expect higher food quality and safety as well as benefits to the environment and own health in comparison to conventional food products. The effect of a growing market for EU quality scheme products on the EU's agri-food trade reflects an issue for further research.

**Competitors (WP4)**

All of the main competitors intensified their agri-food exports and were able to *boost their absolute export value* tremendously. Nevertheless, the *development was quite heterogeneous*. The fastest growth among the selected countries was registered for Russia, Brazil, and Argentina, which respectively increased their export value over the analysed period by 16, four and three times. In the meantime, other nations' export value grew slower than the global average. Thus, Brazil, Argentina, and Russia now play a larger role on world markets than at the beginning of the new millennium. By contrast, other main competitor countries have lost marginal market shares and thus relevance for agri-food trade due to their disproportional growth.

In contrast to the EU, the agri-food exports of the main competitors are *concentrated on a small number of markets and less processed products*. More than 50% of the export value of the USA, Canada, Australia, New Zealand, Russia, and Brazil is often designated to only five markets. By contrast, China and Argentina's export flows are more diversified. The export structure of such countries like Russia, Brazil, Argentina, and Canada is shifting towards less processed products, mainly from processed to bulk. Given that large agri-food exporting countries are often highly specialised, the success of the EU competitors' agri-food export also relies on a small number of products.

One indicator to assess the competitiveness of the competitors apart from the trade structure can be the competitiveness index of the Global Competitiveness Report of the World Economic Forum. The range of the indicator for the major competitors corresponds to the spread of the competiveness index of the EU countries. In principle, this holds for the quality of governance and business environment as well. The *business environment has improved* in those countries that performed relatively poor at the beginning of the century. Since the beginning of the 2000s the *currencies of the emerging countries devaluated against the Euro* thus increasing their competitiveness. The same holds for the US$.

Analysing the EU's and its major competitor's agricultural and trade policies revealed that in the analysed period the *EU had a higher PSE* (Producer Support Estimate) than all major competitors. However, the distance was decreasing overtime. With regard to the producer SCT (single commodity transfers) for the selected food chains the situation is different. The SCT of all countries are at a rather low level, especially at the end of the considered period. One reason may be the increase in food prices, which by trend reduces the impact of market price support in the producer SCT. All competing countries historically use different sets of policies to support its agricultural producers. In the CIS countries (Russia and Ukraine) the policies led to a taxation of domestic wheat production. Conventional *market price support decreased* in recent years. Instead, many competitors support their agricultural sector by *non-product specific means*.

All major competitors, except Russia and the Ukraine, have *regulations regarding organic production*. At the moment there is a *lack of mutual acceptance* of the national standards. The process of accepting standards of organic production between countries has started with the agreement between Canada and the USA (Canada - US Organic Equivalence Arrangement: On June 17, 2009). Especially, countries with export orientated organic production intend to promote those kinds of arrangements in the near future. Despite lacking rules for mutual acceptance, in most major competitors organic production is export oriented.

**Policy (WP5)**

Based on a literature review and analysis of Governance Indicators the overall state regulations for firms in EU countries and the *government's role for sector performance* were analysed.The common conclusion is that the best competitiveness performers have experienced both good governance and policy implementation, while countries with the worst trade performance have faced significant problems in governance structures. Although the competitiveness of the EU food sector remains high, the policy makers should take regular actions to sustain or improve the position. *Knowledge-based and innovation-driven competitiveness* becomes increasingly important for EU-15 and only a few EU-12 countries. Innovation equally addresses production (productivity and specialization) and organization (vertical integration and coordination within food chain). As far as other new member states are concerned, the improvement could be still achieved through *efficiency-driven factors*.

Finally, the EU support to the agricultural producers has shown a steady and substantial decline, from 40% during the 1980s to 20% in 2012, largely due to successive CAP reforms. The reduction in direct payments is overcome by sophisticated forms of institutional support aiming at the promotion of different quality schemes and value added products (PGO, PGI, TSG, Organic, Non-GMO etc.). The changes were driven by the growing importance of complementary food production dimensions, including *social, environmental, health* and *ethical*. The CAP reforms are governed toward *sustainability*, having a particularly strong impact on the EU competitiveness of higher value-added products.

The most important *import barriers* are import tariffs and quotas in the EU, non-tariff barriers (certification of origin, GMO, etc.), regulations related to production methods and quality control (crop protection/pesticides use, growth hormones in meat production, etc.) as well as geographical distance. However, on the *export side*, numerous barriers such as subsidies and tariffs in the export countries, non-tariff trade burdens (phytosanitary/hygiene, veterinary and quality control), consumer preferences, and labelling regulation exist. In particular, complicated administration, corruption and inconsistency in regulation in the export countries intensify these barriers. The solutions for overcoming identified barriers are found in the *market liberalisation* followed by *standardisation* both on bilateral and multilateral level. From the institutional point of view, competences and *responsibilities between national and EU level trade policy* should be clearly defined. In the EU-12 particular attention should be paid to harmonisation of national agri-food policy with EU Strategy 2020.

Unexpectedly, the impact of government policy on competitiveness improvement in the selected countries seemed to be neutral - neither positive nor negative. Innovation process is not equally supported by *publicly available R&D* activities in different countries. Simply, the R&D activity is not fully transformed to serve food chain stakeholders interests. The food sector investment in transition countries are dominantly provoked by foreign traders/retailers who insist on quality standards implementation. Simultaneously, investment in new technologies, e.g. in the Germany food sector, is mainly driven by new animal welfare, energy efficiency, and environment and consumer protection requirements. The main competitiveness drivers are obviously consumer generated.

Discrepancy regarding main drivers of food chain competitiveness at the EU and national level policy exist. *EU policy* is more orientated toward productivity growth, technology improvement, product innovation and specialisation, while agricultural and food policy at the *national level* take more care about organisation innovation and consumer satisfaction.

*Absence of coordination* between stages in the food sector is another important obstacle. Farmers are particularly put in unenviable position, while food processors and traders hold relatively better capacity regarding distribution of market power within the food chain. It is also identified as the main reason why the measures governed at the national level are rather oriented on organisation innovation. Simultaneously, the stakeholders associations are more proactive in developed countries. The contacts with local government, national government and ministries (although on regular basis) have been initiated mainly by problems faced by their members. The less interaction is reported with the local government. It clearly creates an environment for further *promotion of bottom-up approaches* that would lead to the food chain competitiveness improvement regarding specificities identified at the local level.

**Technology (WP6)**

As another determinant of competitiveness the *productivity* of agricultural production and food processing throughout the EU was investigated. One general conclusion is that *technological change* has a significant positive contribution to the production possibilities in majority of countries. The biased technical change is pronounced also for almost all countries. However, the direction of biased technical change differs among the countries and no common patterns can be identified. *Efficiency differences* among producers are important reasons for variation in the production. However, the variation of the average technical efficiency is not large for all EU member countries even if huge differences between the best and the worst farmers exist. High technical efficiency of the 10 % best farmers is the common feature for all countries. The developments of technical efficiency are rather stochastic in many EU member countries and this also holds for factors determining technical efficiency development. Thus, rather idiosyncratic developments of technical efficiency was observed.

Leapfrogging in technical efficiency appears to be a common phenomenon for all member countries in cereal production. This holds for majority of countries in milk and pork production as well. On the other hand, leapfrogging can be denied as far as TFP (total factor productivity) development in cereal as well as milk and pork production is considered.

*Structural change* seems to occur in a way that the most successful producers strengthen their positions. Producers with poor performance will not be able to catch up with the developments of the sector leaders, and therefore are supposed to fall more and more behind. A *positive trend in TFP* in majority of EU member countries is observable. Moreover, technical change was identified as the important factor that contributed predominantly positively to TFP development. This holds for cereal as well as milk and pork production. Moreover, despite the positive TFP development in many countries, *no catching up process* from between the regions was observed. However, despite a period of almost 10 years after accession the *productivity differences* in the agricultural among as well as within countries are quite substantial.

As far as the analysis of food processing industry is concerned significant differences in both sector and firm technologies were revealed. Significant country specifics in technology exist. Moreover, food processing companies highly exploit their production capacities. However, there is *no indication of economies of scale*. The differences between best and average company are not large and are constant over time in the most of EU countries. This suggests that these food processing companies can keep pace with competitors. On the other hand, the worst 10 % of companies are subject of permanent changes and some of them are falling behind.

In addition, there is a *positive relation between agricultural and food processing TFPs*. The farm productivity has a positive effect on productivity and efficiency in food processing industry and food processing productivity determines positively farm productivity and efficiency.

The relationship between the determinants of competitiveness and TFP were analysed. The previous results show that an increase in *import penetration is systematically positively related to productivity growth*. Furthermore, a non-monotonic relationship between the tariff reduction in the exporting countries and the quality upgrading of the EU-15 imports, with varieties close to the world frontier more likely to *upgrade quality in response to an increase in import competition*, exists.

Since the adoption of innovation is an important factor determining TFP growth, policy makers should focus their attention on supporting the spread of innovation and expertise, in order to support productivity growth in less-productive countries and thereby decrease the differences among countries in terms of productivity.

**Market functioning (WP7)**

An analysis of prices reveals a mixed picture regarding the degree to which markets are efficient across sectors and member states. Internal markets are less efficient than expected, with the presence of inefficiencies in price discovery and price coordination in the EU. *Domestic agricultural markets are not perfectly integrated*. The highest degree of market integration across member states is recorded for pork meat, followed by raw milk, eggs, beef, poultry and sheep meat. In general, market integration is higher when trade quantities and values are higher.

The project focused on the organisational and institutional characteristics of the agri-food supply chain to determine their *market functioning*. It was estimated that there are small degrees of non-competitive behaviour in the input food processing market for all analysed sectors, i.e. slaughtering, fruits and vegetables, dairy, and milling. The degree of *market imperfections* differed among the sectors. The EU slaughtering market is characterised by significantly greater market imperfections as compared to the dairy and milling sector, in particular.

The distribution of the relative mark-down is relatively narrow in all sectors, and skewed toward smaller values. Significant differences between the first and last decile were revealed in slaughtering, indicating low *input market imperfections* for the first 10 % of producers, but a considerable degree of non-competitive behaviour for the last 10 % of slaughtering producers. The differences among the producers in fruits and vegetables and especially in the dairy and milling sector are not so pronounced. Thus, it can be conclude that some large companies may exercise market power on the EU input food processing markets.

Revealed significant differences among EU member countries exist. Austria, Belgium, Germany, Finland, France and Italy are countries having a mean of the relative mark-down in slaughtering higher than the EU average. Belgium, Finland, France, the Netherlands, and Romania are countries with a relatively high degree of market imperfections in fruits and vegetables sector. The differences among EU member states are marginal in the dairy and milling sector.

The development of the relative mark-down is characterised by a rather stochastic trend. This holds for the majority of countries in all analysed sectors. However, the relative mark-down for the EU does not change significantly between 2003 and 2012.

On the *output market imperfections* are not so pronounced for the slaughtering sector. However, the degree of market imperfections is higher for the output market in the dairy and milling sector as compared to the input market. The fruits and vegetables sector has almost the same mean for the output as for the input market.

The distribution of the relative mark-up is again relatively narrow in all sectors and skewed toward smaller values. With respect to the dataset, we can conclude that some large companies may exercise market power on the EU output food processing markets.

The development of the relative mark-up is again rather stochastic, and changes are only marginal in the majority of cases. That is, the results suggest that the producers did not significantly change the degree of non-competitive behaviour during the analysed period on the output market between the years 2003 to 2012.

Food markets are more inefficient in sectors/countries with more fragmented farm structures, higher governmental support and more restrictive regulations on price controls in the retail sector, given that asymmetric price transmission in farm–retail relationships is more likely to occur. However, more restrictive regulations on entry barriers in the retail sector tend to promote market efficiency.

On international markets, a meaningful long-run relationship exists between export unit values and exchange rates. There is little evidence of differential *mark-ups between export markets*. Belarus and Iceland are exceptions where the EU exercises local currency price stabilisation, and in the long run a 1% increase in the exchange rate leads to a 0.83% decrease in export unit value. A third of the adjustment to long-run equilibrium takes place in the first year following a shock with full adjustment taking 10 years in the cases of Belarus and Iceland.

**Governance (WP8)**

*Governance of the supply chain* can range from pure market transaction over a wide variety of interactions, e.g. support programs, to vertical integration. The mentioned support programs can compensate support measures such as loans, physical inputs, and guaranteed prices facilitate supplier investments. Support programs are more likely to be offered in uncompetitive environments. The negative competition effect suggests that buyers are constrained in their ability to monitor use of the provided services in an environment where a lot of buyers are competing for the same supply. Improving the enforcement capability of companies under these circumstances is an important challenge for the industry and policy makers. However, buyers seem to be more trustworthy where there is greater competition for supplies. Buyer trustworthiness is also positively correlated with both the size of a supplier, as well as a supplier being a member of a marketing cooperative. Buyer trustworthiness has a positive impact on suppliers' satisfaction (regarding their relationship with their main buyer) and enhances the quality and quantity of suppliers' output.

By considering a historical example from the dairy sector in Poland, it was shown that the *disorganisation of vertical linkages* between upstream and downstream producers can be very *costly*. In the case of Poland, it was estimated that the dislocation of inter-firm relationships accounted for approximately 20% of the drop in milk production observed in the early-transition phase.

The *stability of vertical linkages along a supply chain*, in particular during crises, are determined by a series of factors. The less fragmented the supply base is the more stable a supplier-buyer relations is. Furthermore, the less options farmers have to market their goods, e.g. via direct-marketing, the stronger is the vertical dependency to downstream agents. Additionally, somewhat weaker evidence for the positive correlation between an agri-food supply chain resilience to adverse shocks and the level of commercialisation of agricultural production was found.

Micro-level data from the dairy sector in Poland was used to assess the e*ffect of governance on price transmission* along the chain. Interestingly, the results show that farmers are being

'squeezed' by other stages in the food chain. Moreover, using farmers' subjective opinion on how easy they could be substituted for by their contractors, a proxy for farmers' bargaining power was constructed. Controlling for their size or the quality of their output, it was shown that the latent variable measured by this proxy positively affects the price obtained from the dairy company. It also has a positive impact on discounts at which farmers buy feed from input suppliers, but this result seems to be less clear-cut.

Furthermore, the *effect of trade policy on product quality* was investigated. The reduction of import tariffs as a measure of import competition affects the quality upgrading of the food products exported to the EU. There is a non-monotonic relationship between competition and quality upgrading. In particular, varieties close to the world frontier seem to be more likely to upgrade quality in response to an increase in import competition. This relationship holds true for both developing and developed countries and is even stronger for countries/products targeted by specific FDI (foreign direct investment) policies. Moreover, there is a strong positive relationship between the diffusion of EU voluntary standard and quality upgrading.

Furthermore the so-called 'Collapse in Quality' hypothesis, according to which, during the 2008–2009 crisis, higher quality goods experienced a stronger export reduction compared to low-quality ones was tested. No econometric evidence supporting this hypothesis was found. Instead of lowering quality, firms reduced their mark-up to preserve market shares.

In addition, quality growth proves to be strongly correlated with TFP growth. Moreover, the competitive strategy of countries (high-quality vs. low-price) tends to change when moving from OECDs to non-OECDs. Finally, we provide evidence that the quality and price components of export unit values behave differently when testing their relationship with trade costs.

**Innovation (WP 9)**

An effective *innovation system* is crucial both for agricultural producers and for food companies to cope with competitive pressure. The Agricultural Knowledge and Innovation System is a set of agricultural organisations and/or persons, and the links and interactions between them, engaged in the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilisation of knowledge and information, with 'soft' institutions shaping the behaviour of actors and their interactions.

In terms of EU *research and innovation policy*, several EU institutions and bodies are involved, different funding mechanism, such as the Framework Programs (FP – now Horizon), Competitiveness and Innovation Framework Program (CIP), Structural Funds (SF), and Cohesion Funds. EU support for research dates back to the late '50s, but only during the '80s and '90s coordination of research activities in the Member States became explicit. The need to set the broad policy lines for enhancing innovation, and in particular the aim of a closer correlation between 'knowledge' and 'competitiveness', marks the evolution of the research and innovation policy since '00s.

*Geographical indications* (GIs) are one potential innovative governance mechanism introduced by the EU for adding value to agri-food production and upgrading the competitiveness of small-scale producers. GIs may facilitate upgrading competitiveness via acting as a quality signal, stimulating collective action, and enabling diversification into higher margin activities.

*Research and Development* (R&D) in the agri-food sector distinguishes between supply-side R&D (efficiency improving innovations) and demand-side R&D (marketing innovations). Traditionally, supply-side R&D in the agri-food sector was largely undertaken in public research institutes and has contributed significantly to productivity growth in the agricultural sector. In recent years, supply-side R&D has increasingly been carried out by private actors. Private actors are generally playing a more prominent role in demand-side R&D although examples of generic regional and national promotion efforts also exist.

Additionally, agri-food relevant innovations are developed mainly in agriculture´s upstream sectors. Diverse interrelations between agricultural and non-agricultural technologies exist, so that activities with no main agricultural focus have a considerable influence on agricultural production.

*Innovation strategies* of agri-food firms are distinguished as in-house and outsourcing. The choice between strategies is motivated by transaction cost minimization, property rights appropriation, and optimisation of firms' resources and competences. Results show that decisions to innovate in-house or to outsource are not interlinked; high quality human resources and the use of ICT (information and communication technology) influence both the decision to innovate in-house and outsourcing, while organisational aspects, especially those related to decision-making within the firm, are relevant only for in-house innovation. Finally we also find that large and internationalised firms are more likely to innovate in-house.

*Open innovation* is becoming inevitable to deal with challenges such as a rapidly growing world population, globalisation, and technological changes and it is increasingly seen as a precondition for long-term competitive advantage of the agri-food companies. Start-ups can play a key role in corporate's open innovation strategies. Although corporate-start-up collaborations are already more prevalent in research and business practice in high-tech sectors, this phenomenon is new in the agri-food sector. Best practices should focus on alliance formation, strategic fit, governance mode, access to resources, relationship and trust, and intellectual property protection.

**SWOT and policy recommendations (WP10)**

The results of the previous subparts of the COMPETE project were merged into a SWOT analysis to highlight the *biggest strengths, weaknesses, opportunities, and threats* to the competitiveness of four main EU agri-food value chains (dairy, pork meat, cereals, and fruit and vegetables). In the following, the SWOTs common to all four chains are described.

The *competitivenss of the EU agri-food sector* is mainly driven by a *highly specialised,* agricultural production and processing sector in the old member states, which exploit their production possibilities with *high technical efficency*. *Modern technologies* are quickly adapted and production has been more and more capitalised. A *well-developed physical infrastructure* supports and fosters exports as well as competition. The introduction of new food safety standards, regulations, and other quality controls has promoted *vertical integration, product diversification,* and in general *food safety.*

While the agri-food sector of the old member states seem to meet the challenge with rise of new competitors, e.g. the BRICS, the new member states suffer from a variety of *structural issues*. The new member states' agri-food sector can be generally described by small-scale, undifferentiated, rather inefficient firms, in particular at the primary production stage, which *lack capital* for the adaption of innovation and mechanisation due to the malfunction of credit

markets. Consequently, instead of the diffusion of innovations and catching-up to the level of the EU-15, the *EU-12 is falling constantly behind in terms of productivity*. In addition, the vast supply base in the new member states *lacks organisation and bargain power* and thus often falls *victim to market power abuse* and possible extra income from the implementation of EU quality schemes is not utilised. The *low rate of EU quality scheme applications* in the EU-12 is further dampened by time-consuming and complex registration, control procedures, high costs of conversion, limited awareness of the benefits, and above all insufficient information about the schemes.

Apart from this, the EU and in particular its livestock sector, *heavily relies on fodder imports* and thus is prone to *growing price vo*latility on the world markets. Furthermore, the competitiveness of the EU's agri-food sectors' is afflicted with *large costs* due to environmental protection, food safety, and animal welfare, hindering its ability to compete in prices.

The *global growing demand for agri-food products*, in particular in the emerging countries due to rising incomes and changes in diets, is a great opportunity for the EU to generate income and foster its competitiveness. Especially, *higher-value added products* are highly demanded and benefit EU's export structure, which is skewed toward these kinds of products. In addition, new markets, e.g. *organic products*, are emerging and experiencing exponential growth. These trends allow the EU agri-food sector to diversify its product portfolio, and generate extra income at all stages of the supply chain if utilised correctly.

The *increasing competition from emerging countries*, which benefit from low production costs due to less regulations regarding food safety, is one of the biggest threats the EU agri-food supply chains face for the future. These emerging countries are threatening to catch-up in the terms of technology and production value and thus intensify competition even further. Although, trade liberalisation in form of multilateral and bilateral trade agreements has opened access to a vast number of markets, *sudden changes in trade policy of third countries*, e.g. Russia, i.e. embargos and import restrictions, endanger the export competitiveness of the EU. The globally elongated and fragmented supply chains increase the *risk of food hazards* and prone the EU to *price volatilities and exchange rate fluctuations*. Another eminent threat is the *increase of energy price*, which can lead to an increase in the price of processed products and thus deprive EU's agri-foods sector from its biggest strength.

Overall, it is almost impossible to give one coherent assessment on the competitiveness of the EU's agri food supply chain. The *EU's agri-food sector cannot be seen as an entity*. It rather consists of a variety of sectors and firms, which perform differently due to diverse factors such as market structure. In addition, these sectors are imbedded in countries with heterogeneous geographical conditions, agricultural and institutional traditions, policies and foci, as well as consumer preferences and income. Nevertheless, the COMPETE project elaborated a series of ***policy recommendations***, whose aim is to *boost strengths, eliminate weakness, utilise opportunities, avoid threats* to the competitiveness of the EU's agri-food supply chains.

Due to globalisation and internationalisation of agri-food production, competition is moving from individual firms operating on spot food markets towards complex food chains and networks. Food chains are now fundamentally retailer-driven, giving retailers the potential power to extract more favourable terms than other food chain stakeholders. Policy makers should be aware of the restructuring process in the supply chain, and *avoid power*

*asymmetries.* Effective competition policy that does not permit actors at a particular stage of the supply chain to exploit their power is vital.

To eliminate price asymmetries and market power along the chain, policy actors should *consider the market structure* and *target upstream and downstream sectors simultaneously*, especially in countries with imminent structural change, foster *competition in the buyers' market*, and *promote formation of producer organisations* to reduce fragmentation and increase bargaining power, *'cooperate to compete'*. Inefficiencies in horizontal market integration, producer price and inflation convergences, can easily be eradicated by *better price monitoring and dissemination.*

Furthermore, *farmers should be aided in their attempts to organise and to establish EU quality schemes*, to be able to create value-added and keep it. Apart from supporting the formation of producer organisation, *time-consuming and complex system of application and registration should be simplified* and the *recognition of labels in buyers' markets* promoted.

EU trade policy should encourage productivity growth in the food industry by exploiting the *productivity growth effect of trade liberalisation* and foster competition at the input and output level. Hence, further trade integration due, e.g., to new multilateral and bilateral trade agreements, has the potential to significantly increase firm-level TFP. However, not all import competition affects all firms to the same extent. As results suggest the adjustment to globalization for small firms are more problematic. In this context *public policies should be tailored to the real needs of heterogeneous firms*, in such a way that the adjustment costs to globalisation can be exploited more efficiently.

Additionally, productivity can be further fostered by *improving the access to capital* for farmers and primary processors in the new member states.

*EU policy should create a policy framework that allows firms to adopt competitive strategies* in agri-food markets, with respect to price and quality competition. *Improvements in quality are strongly correlated with TFP growth*. Policy makers should be aware of the fact that an increase in quality does not implicitly correspond to an equivalent increase in prices, but a strategy of lower competitive prices can be accompanied by higher qualities. However, this is not a guarantee that firms will succeed. Therefore, the gap in prices between countries may not necessarily reflect differences in quality, but rather suggest different export strategies or different production and transportation costs.

Good governance and policy implementation are essential prerequisites for general competitiveness. Policy should focus on promoting *knowledge-based* and *innovation-driven* agri-food sector. Innovation activities are observed most in agri-food firms with a high proportion of fixed assets, while firms with already high levels of debt are less likely to innovate. These observations show the importance of firms' financial structure – access to financial resources and decreasing indebtedness spurs innovation. From a policy perspective, this supports arguments in *favour of innovation investment funds*. In addition, collaboration and openness of the innovation process are gaining importance for innovation activities in the agri-food sector. Thus, a *policy framework* should be developed that stimulates o*penness and support research partnerships*.

## 4. THE POTENTIAL IMPACT (INCLUDING THE SOCIO-ECONOMIC IMPACT AND THE WIDER SOCIETAL IMPLICATIONS OF THE PROJECT SO FAR) AND THE MAIN DISSEMINATION ACTIVITIES AND EXPLOITATION OF RESULTS

### 1.1. Impact

The results of COMPETE Project contribute to a better understanding of performance of EU agri-food supply chain on national and international markets. The project provides a coherent and comprehensive picture of competitiveness of the EU agri-food chains and its determinants and contributes to new insights on the strengths, weaknesses, opportunities, and threats to EU agri-food sectors. The COMPETE Project contributes to the existing literature with the analysis of agri-food supply chains along in three dimensions:

1) A conceptual framework for the assessment of supply chain competitiveness.
2) A comparative approach across EU-27 Member countries and main agri-food market players.
3) An in-depth analysis of key factors affecting the competitiveness of EU-27 agriculture and processing industry.

The work programme encompassed actions at all levels of the value chains and for all stakeholders, as it was clear from the start that a maximum impact is not achieved just by stimulating the policy formation, but also by facilitating its implementation. For the latter to be successful, practitioners at each stage of the supply chain, particularly primary producers and their advisers, as well as business associations in the food chain, were motivated and guided effectively. This in turn implied that these practitioners had to be fully involved in the process that creates the policy recommendations and in a wide and deep dissemination of the project's results. Partners' expertise was incorporated in research activities, dissemination activities, and the identification and intensive involvement of stakeholders (target groups) to maximise the impact of the project.

The principal impacts of COMPETE are:

***Improved understanding of the measurement and determinants of competitiveness.*** Through the review of published literature, previous project results, statistics, and expert interviews, determinants of competitiveness of the product chain on both the EU and international markets were identified and analysed, and the specifics of the development trajectories were defined.

The in-depth case studies, based on a regional clustering, were employed to assess the the potential for implementing trajectories for improved competitiveness, giving rise, to an evidence based framework of social, institutional, and technological needs for successful implementation. From the synthesis of this evidence, recommendations were formulated on how developments can be effectively supported by policy at different administrative and production levels (EU, national, regional, farming (supply chain) systems).

In addition to collecting and processing information on agri-food supply chain in order to provide comparative analysis, the COMPETE project contributed significantly to the knowledge on the competitiveness of the EU agri-food supply chains and disseminated its findings to the scientific as well as non-scientific public.

- COMPETE contributes to a better understanding of the functioning of EU agri-food markets by analysing the extent to which these markets are integrated across the EU as well as internationally. Evidence of inefficiencies on internal markets in price

discovery mechanism was found. Furthermore, the asymmetry in price coordination in the EU provides information for policy to select appropriate sector and country specific instruments to reduce the negative effects of market inefficiencies.

- COMPETE provides new sector specific results on productivity and efficiency in agri-food production and processing as well as on total productivity spill-overs between both stages. Moreover, COMPETE provides a coherent and comparative analysis on the productivity and efficiency of EU countries (and Serbia) in a static as well as dynamic perspective and points out the most important determinants of productivity.
  In the framework of the project a new methodology to detect market power was developed. The approach starts with the Lerner index, models the functional relationship in the Lerner index by duality theory and applies efficiency analysis to estimate the extent of market power in all EU countries. The estimates for market power differ among sectors, countries, and between downstream and upstream markets. It was concluded that although some firms were able to exercise considerable market power, the phenomenon, in general, is not a serious problem in European food chains. The results provide the timely evidence in light of current debate on the power distribution along then supply chain.
- COMPETE contributes to a better understanding of supply chain resilience and provides a detailed illustration of potential consequences of (radically) reforming supply chain relations.
- COMPETE discovered interesting new (positive) relationships between food product quality upgrading, national level of competitiveness and diffusion of EU (voluntary) food standards. In particular, these findings support the notion of standards as catalysts of trade (in contraposition to the concurrent hypothesis of standard as a trade barrier). These results could be useful for policy makers, because trade liberalization should be further pursued. However, the adjustment to globalization for small firms is more challenging. For this reason, policy makers should pay particular attention to these firms and tailor public policies to the real needs of heterogeneous firm structures.
- COMPETE contributes to a better understanding of the determinants of innovation processes in the EU agri-food sector. For this review of literature, expert interviews, and both qualitative and quantitative research activities were conducted. Case-study research helped to assess the potential for implementing trajectories for improved competitiveness, with a specific focus on the critical success factors of open innovation strategies and innovation network development.

***Improved policy and institutional framework to foster competitiveness from current models of production and processing to more sustainable paradigms***.

COMPETE provides information and assistance to better address social, institutional, technological, and innovative needs that enable access to and foster the uptake of trajectories towards more sustainable agricultural production and food processing and sustainable innovation practices in the EU agri-food sector in light of the new emerging agricultural and rural development policy as well as the post-Lisbon and EU 2020 strategy.

A central outcome of COMPETE is therefore a set of **policy recommendations** (summarized in the three project policy briefs and D10.2), refined and strengthened by the consultation process described above, which provides essential input to the formulation of European agricultural and competition policy in line with EU 2020. These recommendations and implications have been distributed to relevant European and national officials and elected

representatives, as well as to the stakeholders and experts who contributed to the consultation process – (and who themselves can be expected to influence policy formation and implementation at regional, national, and European level). E.g. in the Netherlands stakeholders have been identified through the network of StartLife, an innovation start-up facilitator and incubator connected to Wageningen University.

Drawing on the case studies, the set of policy recommendations helps to clarify the appropriate balance between top-down policies and bottom-up actions in the context of emerging visions of vertically integrated approaches to sustainable food chain development. It also helps to identify significant barriers to social, institutional, and technological innovation and how these can be removed.

***Mainstreaming of good practice throughout the supply chain and particularly at the farm level***. Creating maximum impact demanded a 'wide and deep' dissemination strategy. The aim of this strategy was to facilitate and encourage actions at all levels of the political, communal, and supply chain stages. In particular, this included promoting collaboration and business conditions for creating and exploiting competitive positions on local and global agri-food markets. For this strategy to lead to action, it was necessary to take into account the reality of the decision-making environment of the principal actors. More importantly, the collection of primary data in the case studies depended on involving actors at various levels and giving them a voice in the process. The research took account of the perceptions of stakeholders on the potential for, and constraints on, transition to sustainable agriculture and food processing. This analysis also helps to meet the demands of different actors along the production chain.

Regarding socio-economic impacts, the research on supply chains was motivated by the fact that they do not always work in the interest of producers, and small-scale farmers in particular are typically in a weak position. In the New Member States and associated countries farmers often face high levels of opportunistic behavior, whereby buyers do not keep their promises (e.g. on payment levels, delayed payments etc.). Research indicated that buyers treat suppliers better where there is competition between buyers, suppliers find it easier to switch between buyers, suppliers are larger and where suppliers are members of a marketing co-operative. Small-scale producers can thus gain countervailing power by marketing collectively. Research was undertaken jointly with a practitioner – Vardan Urutyan, who is a co-author on papers published from the study and the Director of the International Center for Agribusiness Research and Education (ICARE). ICARE have being putting into practice the lessons of the research, specifically regarding the need to stimulate the development of marketing co-operatives. ICARE has been doing this on ground through supporting the development of marketing co-operatives by providing training to farmers.

Furthermore, the formation of the final policy recommendations was subject to a two-step consultation process. Firstly, a consultation workshop with various stakeholders from the EU, national and regional levels was conducted. Secondly, the draft policy recommendations were revised in light of that workshop and were distributed for feedback to a range of experts identified by the partners, ranging from pan-European to local, and representing a range of sectoral interests. In addition, policy brief summarised the project results and their application to policy needs, and were distributed to policy makers at the regional, national, and European levels over the course of the project.

***An open and productive science-policy-society dialogue with respect to improving the competitiveness of food chains***

The success of COMPETE depended heavily on an effective interchange between researchers and major stakeholder. Using different instruments (roundtables, interviews, meetings, and parliamentary evening) the project Consortium encouraged this dialogue. The consortium has reached a wide range of stakeholders throughout the supply chain, as well as opinion-formers in rural communities and policy makers at the national, regional, and local levels. This activities were aiming at (1) the identification the particular needs of the different stakeholders and (2) achieving a real impact on agricultural practice.

Target groups for dissemination:

***European policy makers***

The results are particularly relevant to high-level EU policy makers, who are involved in the formulation of policies and plans across a number of areas including innovation, governance structures in food chains, market functioning, information and communication technologies, and the promotion of the European Knowledge Based Bio-Economy in Europe. European policy makers were actively engaged in the formulation of policy recommendations and thus participated in the stakeholder consultation process (WP11).

***National and Regional Policy makers of EU27***

Policy makers on the national and regional levels were also involved in the case studies (WP8 and 9) and the consultation workshop (WP 11). The implementation of relevant policies was examined in a variety of Member States so that the project was able to assess where they are successful and what best practices could follow other Member States.

***Associated rural businesses (including SMEs)***

The adoption of innovation and the creation of new market opportunities on the national and international levels depends, to a large extent, on the involvement of SMEs. In particular, the agri-food chain in the EU is a major employer and major producer of gross value added. It also has a large influence on the sustainability of farming (primary production). COMPETE examined the importance of these actors to promote innovation and technology transfer. A variety of associated business actors and SMEs were involved in expert interviews undertaken in WP5, 8 and 9, case studies (WP8 and 9), and the stakeholder workshop in (WP11).

***Societal actors including interest groups and consumers***

Groups of societal actors consisting of members of farmers' and business association had been established for each country. Their main task was providing regular advice to the project and approving the developed conclusions and policy recommendations.

***Scientific community***

The results are also of interest to the scientific community in agriculture and food processing, which are the institutions involved in the research and other academic, environmental, agricultural, economic and social research institutes. Project results are available through the project website, newsletters, published conference results, and papers in scientific journals. The results are also relevant to those researching possible new technologies. Established innovation poles were consulted regarding the best way to transfer innovation to a variety of actors. COMPETE exchanged relevant information with scientists working on similar issues by participating in conferences and cooperating with relevant EU projects.

## 1.2. **Dissemination and exploitation of results**

Much attention since the beginning of the project was paid to raise awareness and effective dissemination of project information and results to key actors. Partners discussed and developed a strategy for a constant and dynamic dialogue with the main stakeholders to ensure effective dissemination of project information and the success of COMPETE.

To disseminate the COMPETE results and achieve the expected socio-economic impact, the Consortium relied upon several communication channels and dissemination tools, which constituted a different tasks of WP11.

1. Dissemination material: project leaflet, two press releases, three project newsletters, policy briefs
2. Dissemination events: workshops, roundtables, conferences, organized symposia,

Moreover the COMPETE Project built a strong corporate identity. The specific templates were developed for the project reports, policy brief, newsletters and working papers. A central element of the corporate style and branding of the COMPETE project is the project logo. The templates and logo were placed into the knowledge portal to make them available for each partner. The Corporate style were adhered to all printed and electronic material related to the COMPETE Project.

Below main dissemination tools of COMPETE project are presented. This dissemination material is available on the Project website*www.compete-project.eu*

***Project leaflet***

A two-page leaflet with information about the project's objectives, contents, and findings has been produced and translated by each partner in their official language, offering a concise and visually attractive way of disseminating the project to a wide audience. Each partner contributed to the distribution of the leaflet at both the national and international level using its own network.

***Press releases***

Two press releases were prepared during the project time: at the beginning (November 2012) and at the end (September 2015) of the project. The 1st was prepared and disseminated with information related to the structure of the consortium and the project's main research objectives). The 2nd Press release has informed about main findings of the project.

The press release were distributed by e-mail to magazines, newspapers, and websites in participating countries in the area of agriculture and food supply chain.

***Project Newsletters***

COMPETE **Newsletters** have been circulated, at regular intervals, to communicate on the on-going progress of the project, the already achieved results and event. Three project Newsletters were published over the project time. The first newsletter launched in February 2014. The second COMPETE Newsletter on interim results of the project, meeting and new publications was launched in September 2014. And the 3rd Newsletter was published in November 2015 and summarizes the main results achieved, the dissemination activities, scientific publications as well as provides information about past project events

The Compete Newsletters were announced and disseminated through the project website as well as partners´ institutions websites and sent to a list of potentially interested stakeholders.

***Policy Briefs***

Three Policy Briefs were published during the course of the project. The first policy brief was published in June 2013, provides a snapshot of the competitiveness between the EU and its main trade partners (Brazil, USA, China, and the Russian Federation), as well as a statement about how target-oriented public policy is needed to improve the sustainability and competitiveness of the EU agri-food sector.

The 2nd Policy Brief was published in May 2014 (month 20) summarizes the project findings on the competitive EU sectors and major EU competitors on the world agri-food market. The focus here was to give an overview of the heterogeneity in competitiveness across EU countries and food sectors results on in-depth interview to srtakeholders according to the the main policy interventions on agri-food trade and their impact on supply chains.

The 3rd policy Brief was published in September 2015 and summarizes the main results of COMPETE Project and the policy recommendations.

Like newsletters and project leaflet as well as both policy briefs were translated by partners into national languages and disseminated through their own networks.

***Participation in international conferences and other relevant events***

During the reporting period main findings of the WPs have been presented by partners at international conferences, workshops, seminars and meetings. Such conference participation provides an opportunity to develop national and international connections with industrial, governmental, and academic thought leaders as well as to engage in direct face-to-face communication and discourse. Below, we report a table summarizing the main conferences.

**Table 1: Participation of COMPETE partners at main conferences**

| Date | Conference | Partners |
|---|---|---|
| 11-12 April, 2013 | COMPETE PhD Workshop, Belgrade, Serbia | IAMO, BSN |
| 29-31 May 2013 | EAAE PhD Workshop Leuven, Belgium | UMIL |
| 01-03 July, 2013 | ECOMOD conference Prague | CULS |
| 01-05 July, 2013 | Efficiency and Productivity Analysis Workshop by Prof. Kumbhakar, Prague, Czech Republic | IAMO |
| 02-04 June, 2013 | IATRC Symposium, Seville, Spain | UMIL, UNIWARSAW |
| 13-15 June, 2013 | COMPETE PhD Workshop, Warsaw, Poland | UNIWARSAW, BSN |
| 17-20 July, 2013 | EWEPA conference, Finland | CULS, IAMO |

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|---|---|---|
| 27-28 September, 2013 | WNE UW conference, Kazimierz Dolny, Poland | UNIWARSAW |
| 03-04 October, 2013 | ERDN Conference, General Berthelot, Romania | IEA |
| 18 October, 2013 | Seminar, Slovak Agricultural University, Nitra, Slovakia | UNIWARSAW |
| 06-08 November, 2013 | Workshop "Economics in Transition", Budapest, Hungary | IAMO, UP, WU, UMIL, CULS, UNIWARSAW |
| 10 December, 2014 | XIXth IEA conference "The perspectives of the agriculture and rural development through new CAP 2014-2020", Bucharest, Romania | IEA (Scientific community, policy makers, medias, industry, civil society-stakeholders) |
| 12-13 December, 2013 | EAAE Seminar, Perugia, Italy | UNIWARSAW |
| 09- 11 April, 2014 | Agricultural Economics Society Conference AgroParisTech, Paris, France | UNEW, CERS-HAS |
| 19-24 May, 2014 | Workshop "Organizing the Agri-Food Supply Systems in the European Union", Perugia, Italy | WU |
| 21-23 May, 2014 | 13th International Scientific Days (MVD 2014), Pribylina, Slovakia | CULS, UNIWARSAW |
| 29-30 May, 2014 | 142nd EAAE Seminar "Growing Success? Agriculture and rural development in an enlarged EU", Budapest, Hunagry | UNEW: IAE, UP, CULS |
| 4–6 June, 2014 | 11th Wageningen International Conference on Chain and Network Management WICANEM, Isle of Capri, Naples, Italy | All partners |
| 13-23 June, 2014 | IFAMA conference, Cape Town, South Africa | WU |
| 17 June, 2014 | AGERDEV Workshop "Agricultural Economics and Rural Development at the beginning of the programming period 2014-2020 in EU member states – Comparative analysis for Romania and Hungary", | IEA |

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|---|---|---|
| | Budapest, Hungary | |
| 25 June, 2014 | COMPETE Forum, German Foreign Trade Day, Berlin, Germany, | IAMO, BVE, stakeholders |
| 25-26 June, 2014 | IAMO forum 2014, Halle (Saale), Germany | IAMO, UP, CERS-HAS |
| 25-27 June, 2014 | AIEAA Conference "Feeding the Planet and Greening Agriculture: Challenges and opportunities for the bio-economy", Alghero, Italy | UMIL |
| 27-29 July, 2014 | 2014 AAEA meeting, Minneapolis, USA | UMIL; CERS-HAS |
| 22-26 August, 2014 | Ph.D. Course "Empirical Applications of Economic Organization and Institutions in Agri-Food Value Chains", Koper, Slovenia | IAMO |
| 26-30 August, 2014 | "Agri-food and Rural Innovations for Healthier Society", 14th EAAE Congress Ljubljana, Slovenia | IAMO, CULS, WU, UP, CERS-HAS, UNIWARSAW |
| 24-26 September, 2014 | Workshop "Global Value Chains for Food and Nutrition Security", Rome, Italy | UMIL |
| 12-13 December, 2014 | Transition in Agriculture – Agricultural Economics in Transition XI., Budapest, Hungary | IAMO, CULS, CERS-HAS, UP, UNIWARSAW |
| 02-06 January, 2015 | ASSA Meeting, Boston, USA | UMIL |
| 09-13 February, 2015 | 2015 IGLS Forum, Innsbruck, Austria | UNIWARSAW, WU |
| 13-15 April, 2015 | Annual Agricultural Economics Society conference, Warwick, UK | UNEW |
| 14-15 April, 2015 | EAAE Seminar on Intellectual Property rights for Geographical Indications, Parma, Italy | UNEW |
| 17-23 May, 2015 | ESNIE Workshop, Corsica, France | WU |

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|---|---|---|
| 29-30 May, 2015 | MIC Conference, Portoroz, Slovenia | All partners |
| 08-10 June, 2015 | 6th EAAE PhD Workshop, Rome Italy | IAMO |
| 11-12 June, 2015 | AIEAA Conference "Innovation, productivity and growth: towards sustainable agri-food production", Ancona, Italy | UMIL |
| 09 June, 2015 | Seminar, WNE UW, Warsaw, Poland | UNIWARSAW, stakeholders |
| 02-04 July, 2015 | WIEM Conference, Warsaw, Poland | UNIWARSAW |
| 06-07 July, 2015 | Seminar, University of Perugia, Italy | UNIWARSAW |
| 08-14 August, 2015 | International Conference of Agricultural Economists (ICAE), *Organized Symposium*, Milan, Italy | IAMO, UP, UNEW; UNIWARSAW, UMIL, WU, CERS-HAS, CULS |
| 04 September, 2015 | IPTS seminar, Seville, Spain | UNIWARSAW |
| 08-10 September, 2015 | SERiA Congress, Kołobrzeg, Poland | UNIWARSAW |
| 10-12 September, 2015 | ETSG Conference, Paris, France | UNIWARSAW |
| 16-18 September, 2015 | Agrarian Perspectives XXIV international conference, Prague, Czech Republic | CULS |
| 22 September, 2015 | COMPETE final consultation Workshop, Brussels, Belgium | COMPETE partners, representatives from science, EU and national policy, industry. |
| 29 September, 2015 | Seminar, WNE UW, Warsaw, Poland | UNIWARSAW, stakeholders |
| 29 September, 2015 | Parliamentary Evening, Berlin, Germany | BVE, IAMO, stakeholders |
| 29 September, 2015 | IEA-FP7 COMPETE Final International Conference "The competitiveness of the agrifood chains in the EU", Bucharest, Romania | IEA (Scientific community, policy makers, medias, industry, civil society-stakeholders) |

***Other meetings and events***

Additional to the conferences and project internal meetings, other important meetings and events took place over the project's three-year duration.

*Scientific writing workshop and management workshop*

The workshops have been held to improve young researcher effectiveness in doing their research, presenting it in written and oral form to scientific and non-scientific stakeholders, and getting funding for future project. This task is particularly related to partners from South-East Europe, who frequently struggles to get their scientific manuscripts through peer review evaluation processes. Five training courses (originally only two were planned) were organized given during the project time by BSN together with COMPETE partners:

1st - Faculty of Economics, Belgrade University (BEL): 11-12, 17-18 April 2013

2nd - Business School, Newcastle University (UNEW): 23 May 2013

3rd - Faculty of Economic Sciences, Warsaw University (UNIWARSAW): 13-15 June 2013.

4th - Czech University of Life Sciences Prague (CULS), Czech Republic- a two-day workshop on 27-28th November, 2014

5th - University of Primorska, (UP), Slowenia - a one-day workshop on 27th May, 2015

Over 80 participants attended the workshops.

The leaflet of training course is available on the COMPETE Website

*COMPETE Organised Symposia*

The main results of the COMPETE project were presented to the scientific community during the 29th Triennial Conference of the International Conference of Agricultural Economists (ICAE) in Milan, Italy from 9 to 14 August, 2015 during Two ***Organized Symposia*** titled "Market conduct in European agri-food chains" and "Innovation, product quality and performance in agro-food supply chains"

*Workshops and Roundtables*

In connection on project meeting and scientific conferences COMPETE Workshops and Roundtables were organized:

1 June 4, 2014 in Anacapri, Italy. "Innovation and competitiveness in the European agri-food sector: the stakeholder's prospect"
2 November 26-27, 2014, Prague, Czech Republik The competitivenes of the European food chain: regional and policy perspective
3 May 29-30, 2015 in Portoroz, Slovenia. The agri-food supply chain: opportunities and threats for increasing of competitiveness (in connection to the milk sector)

The roundtables provided opportunity to disseminate and discuss the country and sector specific project results and collect experts view and opinion according to the opportunities and threats for increasing the competitiveness of agri-food supply chain in EU countries.

*COMPETE Forum Berlin*

In the context of the 6th Agribusiness Foreign Trade Congress of the German food industry, the COMPETE special forum took place in the German Federal Foreign Office in Berlin on 25th June 2014. The invited speakers Roxane Feller (FoodDrinkEurope) offered the industry's view on the COMPETE project with her presentation "Prospects and chances of the European food and drink industries regarding COMPETE" and closed the presentation by emphasizing her own and the industry's interest in the results of the COMPETE project and particularly deduced policy recommendations. The project coordinator Heinrich Hockmann reported the most recent results of COMPETE regarding the European dairy production and industry. He pointed out that the "overall objective of politics and industry should be the promotion of innovative capacity, to maintain free competition without market barriers and to support investments in research and development in order to improve export orientation and competitiveness of EU countries".

*Parliamentary evening "Competitiveness: EU research project COMPETE"*

A very successful measure to communicate information and ideas to policy makers are parliamentary events that address mainly policy makers in their working environment.

In addition to the originally in Annex 1 planned dissemination activities the COMPETE partner Federation of German Food and Drink Industries (BVE), supported by the project coordinator, hosted the Parliamentary Evening "Competitiveness: EU research project COMPETE". It took place on 29 September 2015, in Berlin, Germany. More than 60 participants from German politics and representatives of producers and processors organizations attended the event. After the main findings of the COMPETE project were presented by Prof. Dr. Thomas Glauben, Director of the Leibniz Institute of Agricultural Development in Transition Economies (IAMO), the participants discussed and debated the results of three years of research during the rest of the evening. Dr. Wolfgang Ingold, Chairman of BVE, explained the view of the German food industry on their competitiveness. Among others he amplified that one third of the market offers in Germany are new products confirming the sector's innovativeness. Nevertheless new innovations have to be supported to claim world market shares or rather win these back. Moreover, the role of EU and German politic was emphasized in order to create basic conditions and incentives which support research and development and facilitate access to important export and import markets as well as enable competition.

*Final consultation workshop in Brussels*

The final COMPETE workshop gave leading representatives from industry, science and practice the opportunity to meet and discuss the key findings of the project as well as formulated policy recommendations for a sustainable development of competitiveness of EU agri-food supply chains.
The event took place on September 22, 2015 in Brussels, Belgium.

After the official end of the project, dissemination activities are ongoing. For example, Co-Coordinator Heinrich Hockmann (as Invited speaker) presented and discussed with representatives of policy, EU primary food industry and science selected project results at the Forum "The essential role of EU Primary Food Processors in a strong & competitive EU agri-food sector", on 29 October, 2015 in Brussels, Belgium.

***Publication of project results***

Key findings of the research project were published in high ranked international journals (see below). Moreover, the COMPETE Consortium launched a series of working papers, which is available on the website, at *www.compete-project.eu*.

**COMPETE publications in peer-reviewed journals:**


Bakucs Z., Bojnec S., Fertő I. (2014). Spatial product market integration between two small open neighbouring economies. *Agribusiness: an International Journal, 00 (0):1–17*

Bakucs Z., Fałkowski J., Fertő I. (2014). Does Market Structure Influence Price Transmission in the Agro-food Sector? A Meta-analysis Perspective. Journal of Agricultural Economics, *65 (1): 1-25.*

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Bojnec, Š., Fertő, I. (2013). How European Union countries are competitive in international agro-food exports? Industry, Science and Policy Makers for Sustainable Future: Proceedings of the 14 The International Conference. *Koper: Faculty of Management, pp. 401-423.*

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Since the beginning of the project *twenty one* COMPETE Working papers were published. To secure the quality of the published papers, an efficient, internal revision system was established.

**COMPETE working papers:**

Hockmann, H., Levkovych, I., Grau, A. (2013): Review of recent developments in the agri-food sector, COMPETE Working paper N1

Gorton. M., Hubbard, H., Fertő, I. (2013): Theoretical background and conceptual framework, COMPETE Working paper N2

Olper, A., Pacca, L., Curzi, D. (2013): Trade, Import Competition and Productivity Growth in the Food Industry, COMPETE Working paper N3

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Blatnik, P., Bojnec, Š: (2015): Dairy market in Slovenia, COMPETE Working paper N18

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**COMPETE book:**

To complete the dissemination plan, as foreseen in Annex I, a final book "Competitiveness and performance of EU agri-food chains" has been edited by IAMO. The COMPETE book , which will include selected results of the COMPETE project. So far partners submitted the title of their contributions and the structure of the COMPETE book was prepared by IAMO.

This book is composed of 18 chapters, structured in five parts. The full table of contents is provided in Annex 2.


The Consortium has submitted five papers to the Journal of Agricultural Economics to provide COMPET ***Special Issue***. The review process is ongoing.

Other **dissemination activities** of COMPETE partners during the project time are presented on the COMPETE knowledge portal. The list includes meetings with local stakeholders, the distribution of COMPETE leaflets and policy briefs, posters and paper presentations regarding project results at the meeting, workshops and conferences, exhibitions etc.

**COMPETE website**

The internal and public website (***www.compete-project.eu***) have been set up at an early stage of the project and regularly updated throughout the lifetime of the project. The COMPETE website is fully operative (see *http://www.compete-project.eu*), providing relevant information for stakeholders and the interested public about results (newsletters, working papers, publications, etc.). Moreover, information about the participating institutes, project objectives and structure as well as project activities can be found on the website. The website has been updated regularly with project deliverables, publications, working papers, policy briefs, and newsletters. In addition to the general information, project partners have access to the

knowledge portal (protected members area), that provide COMPETE relevant administrative documents (the Grant Agreement, DOW, etc.), templates, and guidelines as well as minutes of meetings. Since January 2013 the number of hits has been increasing steadily.

**CONTACT**


The Consortium of COMPETE brings together academics, trade bodies, NGOs, an agricultural co-operative and industry representative advisory services. In addition, the project was supported by a group of societal actors, incorporating farmer, food processing and consumer associations, providing in-depth knowledge on the agri-food sector and speeding up the achievement of the project goals.

The COMPETE consortium consists of 16 Partners from 10 European countries:

- Leibniz Institut fuer Agrarentwicklung in Transformationsökonomien (IAMO), Germany – the project coordinator
- Institute of Agricultural Economics (IAE), Romania
- Wageningen University (WU), The Netherlands
- Univerza na Primorskem- Universita della Primorska Universita del Litorale (UP), Slovenia
- Ceska zemedelska univerzita v Praze (CULS), Czech Republic
- Universita degli Studi di Milano (UMIL), DEPA, Italy
- University of Newcastle upon Tyne (UNEW), United Kingdom
- Ekonomski Fakultet, Univerzitet u Beogradu (BEL), Serbia
- Magyar Tudomanyos Akademia Kozgazdasagtudomanyi Intezet (CERS-HAS), Hungary
- Uniwersytet Warszawski (UNIWARSAW), Poland
- Vod Jetřichovec, Družstvo (VODJ), Czech Republic
- Potravinarska komora Ceske republiky (FFDI), Czech Republic
- Balkan Security Network (BSN), Serbia
- Asociatia Romana de Economie Rurala si Agroalimentara "Virgil Madgearu" (ARERA), Romania
- Bundesvereinigung der Deutschen Ernährungsindustrie e.V. (BVE), Germany
- Federazione Italiana dell'Industria Alimentare Associazione (FED), Italy

**COMPETE Website: http://www.compete-project.eu**

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Annex

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