An initiative of the Food Sector for the protection of the environment

LIFE+ FOODPRINT

LIFE13 ENV/GR/000958

Action C: Monitoring of the impact of the project actions

Deliverable C.2	**Evaluation of the current socio-economic impact regarding pastry and flour food industry**

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Version 3

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Disclaimer

The information included herein is legal and true to the best possible knowledge of the authors, as it is the product of the utilization and synthesis of the referenced sources, for which the authors cannot be held accountable.

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ABBREVIATIONS AND ACRONYMS

BAT	Best available techniques
EU	European Union
FISS	Food Industry Sustainable Strategy
GDP	Gross domestic product

1 INTRODUCTION

The objectives of Action C.2 are:

- ✓ Assessment and evaluation of the current socioeconomic situation in the food industries of Greece and Italy
- ✓ Identification and analysis of the socioeconomic problems in the selected industries

In order to evaluate the socio-economic impact of the project, specific indicators will be set and subsequently used for the assessment of the project's socio-economic impact on the food industries of Greece and Italy and their associated chain supply.

The minimization of CO_2 emissions of products with high sales will have a major economic and social impact. The formation of indicators that are able to make these impacts apparent will show the importance of the actions that will be taken by the industry based on the recommendations of the carbon tool.

2 CURRENT SOCIO-ECONOMIC IMPACT OF THE FOOD INDUSTRIES

2.1 Food industries in Greece

2.1.1 Background

According to the Hellenic Federation of Enterprises (SEV), the food and beverage industry in Greece is a prominent sector, strengthening the productive fabric, maintaining the growth momentum and investing not only in the development of its activities and the markets, but also in research, technology and human resources as well as in systems that support its operation. The Greek food and beverage industry is described in the Report of the Foundation for Economic and Industrial Research as a dynamic, competitive and extroverted industry, with significant investment and business activity in Greece, the Balkans and throughout Europe (Thomaidou, 2014). Estimates based on foods and beverages companies, present these industries, for the entire manufacturing sector, covering 25% of turnover, holding 25% of total capital, producing 24% of total value added and employing over 22% of employees (SEV, 2011).

Eurostat figures show relevant estimates of 2009 for Greece and Europe. Accordingly, the number of food businesses in Greece accounts for 18.90% of all enterprises and in Europe the 12,30% (Table 2). Turnover for food production in Greece accounts for 20.20%, while in Europe 13.50% (Table 3). Continuing, the value of food production in Greece accounts for 20.40% and for Europe 13.80% (Table 4). Moreover, the Gross Value Added of food production in the country stood at 19.70% and at continental level 11,30% (Table 5). Finally, the number of employees was as high as 20.30% of the total workforce in the country and 13.50% in Europe (Table 6). The latter size is very important since according to OECD data in the third quarter of 2014 unemployment in Greece stood at 26.2%.

Table 1:Number of Processing firms in Greece an European Union[2]

Greece		EU-27	
Processing (83.565 firms)	100,00%	**Processing** (2.040.000 firms)	100,00%
Food products	18,90%	**Metal products**	17,90%
Metal products	15,10%	**Food products**	12,30%
Clothing	13,00%	**Wood products**	8,40%
Furniture	8,70%	**Machinery and equipment repair**	7,60%
Wood products	7,70%	**Clothing**	6,30%

[2] Source: Eurostat, 2009

Table 2:Turnover of Processing in Greece and European Union[3]

Greece		EU-27	
Processing (€54.884 mil.)	100,00%	**Processing**(€5.800.000 mil.)	100,00%
Coke and refined products	21,80%	**Food products**	13,50%
Food products	20,20%	**Manufacture of motor vehicles**	10,80%
Metal products	7,60%	**Manufacture of machinery and equipment**	8,80%
Basic metals	7,50%	**Chemicals**	7,20%
Products from non-metallic minerals	5,90%	**Metal products**	6,90%

Table 3:Production Value of Processing in Greece and European Union

Greece		EU-27	
Processing (€50.150 mil.)	100,00%	**Processing**(€5.200.000 mil.)	100,00%
Food products	20,40%	**Food products**	13,80%
Coke and refined products	18,70%	**Manufacture of motor vehicles**	10,00%
Metal products	8,20%	**Manufacture of machinery and equipment**	8,90%
Basic metals	7,70%	**Metal products**	7,40%
Products from non-metallic minerals	6,40%	**Chemicals**	7,20%

Table 4:Gross Value Added of Processing in Greece and European Union

Greece		EU-27	
Processing (€16.901 mil.)	100,00%	**Processing**(€1.400.000 mil.)	100,00%
Food products	19,70%	**Food products**	11,30%
Metal products	9,40%	**Manufacture of machinery and equipment**	10,70%
Products from non-metallic minerals	8,40%	**Metal products**	9,80%
Coke and refined products	7,60%	**Manufacture of motor vehicles**	7,10%
Beverages	6,30%	**Chemicals**	6,60%

[3]Source: Eurostat, 2009

Table 5:Number of employees of Processing in Greece and European Union

Greece		EU-27	
Greece		**EU-27**	
Processing (400.943 employees)	100,00%	**Processing**(31.000.000employees)	100,00%
Food products	20,30%	**Food products**	13,50%
Metal products	11,90%	**Metal products**	11,70%
Clothing	7,40%	**Manufacture of machinery and equipment**	9,40%
Products from non-metallic minerals	6,70%	**Manufacture of motor vehicles**	7,20%
Furniture	5,20%	**Manufacture of rubber and plastic**	5,30%

Regarding the households' demand for food and beverage products in EU countries compared to Greece, we observe that consumption in Europe showed a large decrease between 2003 (18.1%) and 2008 (14.6%), and then rises, reaching 16.2% in 2011. Greece follows the same path with smoother spin rates.

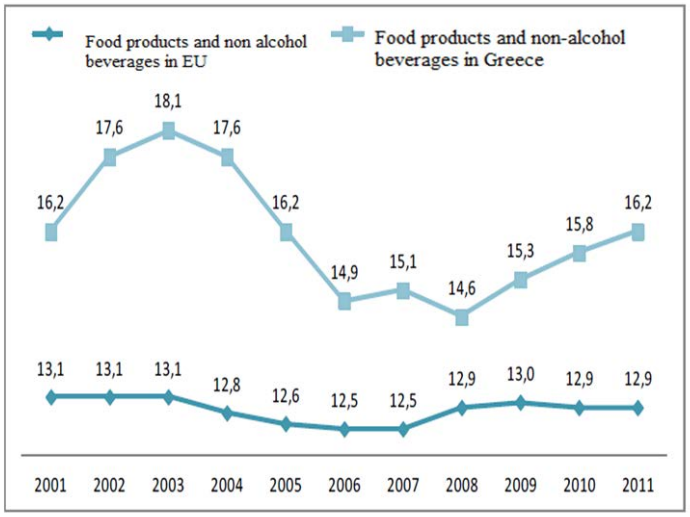

Figure 1: Intertemporal distribution percentage of final demand for food and non-alcoholic beverages in EU and Greece

2.1.2 Pastry and flour industries

The Greek Pastry and Flour food industry holds the highest percentage (60%) within Food and Drink companies as a whole. It also holds 33.5% of the companies employing personnel of more than 10 people. For companies employing fewer than 10 people, the Pastry and

Flour industry in Greece has 50% of all food and drink branches in all structural indices. This means 61% of all employees, 61.5% of all companies, 57.5% of gross product value, 56.3% of added value, 57.9% of sales and 51.4% of investment expenditure. Studies have shown that Pastry & Flour food industry products acquire a large share to the total contribution of food industry which equals around to 15%.

The distribution of the food sub-sectors throughout the food and beverage sector, based on the main structural elements, is illustrated below.

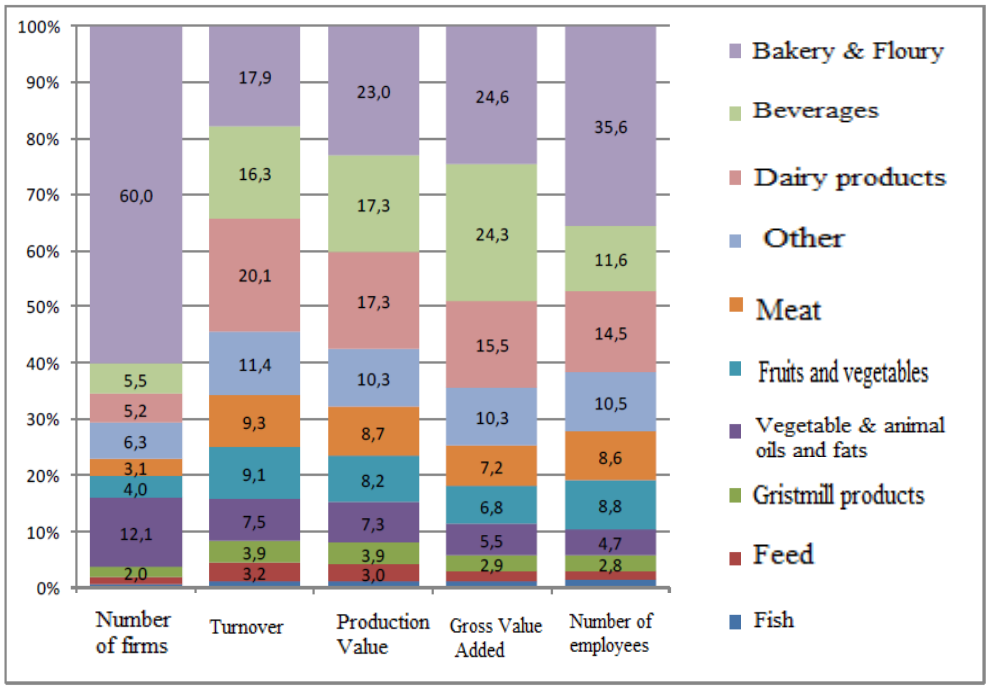

Figure 2: Distribution percentage of food subsectors throughout the food and beverage sector based on the main structural elements

The sub-sectors of bakery and floury and gristmill products, represent 60% of the total number of food and beverage companies, 21.8% of total turnover, 26.9% of the total production value, 27.5% of the total gross value added and 38.4% of the total number of employees. Possibly, these percentages would be greater if other sub-sectors were added such as confectionery products and baby foods, which are examined in the case study of industry JOTIS.

According to Euromonitor data for Greece, pastry food sales for 2013 and 2014 were relatively stable, with minor fluctuations. In recent years, sales points for deserts have changed from kiosks to supermarkets. Sales of bakery products were already high, so the increase in sales was limited, given that the Greeks showed a preference for packaged bread products.

The economic recession, appears to have affected food production. The annual percentage change in production volume index at sub-sectors of food from 2008 to 2013 is presented below. In 2013, the Production Volume Index is moving downward in Greece in almost all fields of food. At a European level, 2013 recorded a fall in the benchmark in all fields of food, except from bakery in which marginal increase in the Eurozone is of 0.6%, and dairy products where the increase in the EU is of 0.3%.

Table 6:Annual percentage change in production volume index in food subsectors

Year	2008	2009	2010	2011	2012	2013
	Production of dairy products					
EU-28	-1,8	-1,5	1,9	0,9	-0,3	0,3
Euro zone	-1,3	-1,7	1,5	0,0	-0,5	-0,3
Greece	0.5	-3,0	-0,9	-4,0	-5,5	-4,4
	Production of gristmill products, starch production and starch products					
EU-28	0,8	-3,7	3,1	-2,0	1,6	-0,1
Euro zone	-0,1	-2,5	3,4	-1,1	1,8	-0,7
Greece	-9,3	-4,7	0,8	-1,2	-3,1	-3,6
	Production of bakery products and floury products					
EU-28	0,6	-2,2	3,5	1,3	0,2	-0,1
Euro zone	0,7	-2,2	1,5	-1,1	0,4	0,6
Greece	2,2	-1,0	-7,1	-1,9	-5,0	-2,2
	Production of other food products					
EU-28	-3,3	0,0	-0,4	0,2	-1,9	-0,4
Euro zone	-1,8	0,4	1,4	1,6	-2,1	-0,1
Greece	2,6	6,3	-12,0	-4,2	-4,5	-0,9

Studying the changes in human resources rate of food industries in each sub-sector for the years 2008-2013, it is noted that employment in food records a significant increase of around 10.3% compared to 2012. During the years 2013/2012 there is a rise in the sub-sector of gristmill products, starches and starch products, as well as in bakery and floury products.

Table 7: Annual employee changes: Food and sub-sectors[4]

Changes	2009/ 2008	2010/ 2009	2011/ 2010	2012/ 2011	2013/ 2012
Process-meat refrigeration-production of animal products	6,2%	51,4%	-19,2%	-0,7%	8,8%
Process & refrigeration of fish, crustaceans and molluscs	51,6%	7,9%	13,9%	-19,1%	52,1%
Process & refrigeration of fruits and vegetables	-12,3%	12,4%	30,0%	-16,0%	-0,5%
Production of vegetable and animal oils & fats	-7,0%	-21,3%	-13,9%	3,3%	64,8%
Production of dairy products	-2,3%	10,8%	-28,6%	0,1%	18,7%
Production of gristmill products, starch production and starch products	6,5%	26,6%	-40,6%	-28,4%	50,9%
Production of bakery products and floury products	16,4%	-3,5%	-5,6%	-16,9%	8,0%
Production of other food products	6,2%	-7,2%	-10,8%	10,5%	2,5%
Production of prepared feeds	-44,8%	36,0%	-7,8%	-56,4%	-59,9%
Beverages production	-3,9%	-2,6%	4,2%	-6,0%	-13,1%
Total of food products	6,8%	3,2%	-9,0%	-10,6%	10,3%
Total of food products and beverages	5,8%	2,7%	-7,9%	-10,2%	8,1%
Processing Total	-3,9%	-8,3%	-10,7%	-14,5%	-7,2%

[4] Source: EED - EL.STAT

3 LITERATURE REVIEW ON SOCIOECONOMIC INDICATORS

3.1 Necessity and quality of socioeconomic indicators

Socioeconomic Indicators reflect the quality of life. However, over time, the concept of quality of life changes, and needs to be updated and redefined in order to include a greater number of factors. The European Foundation for the Improvement of Living and Working Conditions reports that much of the research done during 2004 focused on gaining a better understanding of quality of life, living and working conditions and industrial relations in the new Europe.

Sustainability Reporting Guidelines propose the assessment of the following socioeconomic indicators**:**

- ✓ Direct economic value generated and distributed (including revenues, operating costs, employee compensation, donations and other community investments, retained earnings and payments) to the providers of capital and governments.
- ✓ Financial implications, risks and opportunities for the organization's activities due to climate change.
- ✓ Coverage of the organization’s defined obligations.
- ✓ Financial assistance from the government.
- ✓ Percentage of the typical level of starting salaries compared to local minimum wage at significant operation locations.
- ✓ Policies, practices and spending rate on locally-based suppliers at significant operation locations.
- ✓ Procedures for local hiring and rate of senior management hired from the local community at significant operation locations.
- ✓ Development and impact of infrastructure investments and services provided primarily for public benefit (commercial, in-kind, or free).
- ✓ Understanding and describing significant indirect economic impacts, including the extent of impacts.

3.2 Basic characteristics of valuable environmental indicators

Effective indicators should be based on the following characteristics:

1. Relevant.
2. Easy to understand, even by people who are not experts.
3. Reliable, in order for people to be able to trust the information of the indicator.
4. To be based on accessible data, that is available or can be gathered while there is still time to act.

3.3 Examples of socioeconomic indicators in food industry

The Food Industry Sustainable Strategy (FISS), argues that the adoption of best practices is the way that will lead the food industry to environmental, economic and social development (DEFRA, 2006).

The following Table presents the proposed indicators in food production, as well as the stakeholders at each production stage. Some of these indicators, related to this research, are the percentage of investment return, the geographic proximity of grower, processor, packager and retailer, the ratio of food wasted to food consumed, the percentage of Agricultural Schools that offer sustainable agricultural programs and encourage sustainable practices, and the ratio of (edible) food wasted to food donated to food gatherers.

Table 8:Life Cycle Sustainability Indicators for the Food System (Source: Heller & Keoleian, 2000)

Stakeholders	Life cycle stage	Economic Indicators	Social Indicators
Farmers **Breeders** **Seed Companies**	Origin of (genetic) resource – seed production, animal breeding	✓ degree of farmer/operator ✓ control of seed production/breeding	✓ diversity in seed purchasing and seed collecting options ✓ degree of cross-species manipulation
Farm operators **Farm workers** **Ag. Industry** **Ag. Schools Government** **Animals**	Agricultural growing and production	✓ rates of agricultural land conversion ✓ % return on investment ✓ cost of entry to business ✓ farmer savings and insurance plans ✓ flexibility in bank loan requirements to foster environmentally sustainable practices ✓ level of gov't support	✓ average age of farmers ✓ diversity and structure of industry, size of farms,# farms per capita ✓ hours of labor/ yield and / income ✓ avg. farm wages vs. other professions ✓ # of legal laborers on farms, ratio of migrant workers to local laborers,% workers with health benefits. ✓ # of active agrarian community organizations ✓ % of ag. Schools that offer sustainable ag. programs, encourage sustainable practices ✓ # animals/unit, time animals spend outdoors (animal welfare)
Food processors **Packaging providers** **Wholesalers** **Retailers**	Food processing,packaging and distribution	✓ relative profits received by farmer vs. processor vs. retailer ✓ geographic proximity of grower, processor, packager, retailer	✓ quality of life and worker satisfaction in food processing industry ✓ nutritional value of food product ✓ food safety

Stakeholders	Life cycle stage	Economic Indicators	Social Indicators
Consumers **Food service** **Nutritionists/Health professionals**	Preparation and consumption	✓ portion of consumer disposable income spent on food ✓ % of food dollar spent outside the home	✓ rates of malnutrition ✓ rates of obesity ✓ health costs from diet related disease/conditions ✓ balance of average diet ✓ % of products with consumer labels ✓ degree of consumer literacy regarding food system consequences,product quality vs appearance, etc. ✓ time for food preparation
Consumers **Waste managers** **Food recovery & gleaning orgs**	End of life	✓ ratio of food wasted to food consumed in the US ✓ $ spent on food disposal	✓ ratio of (edible) food wasted vs. donated to food gatherers

Moreover, in a survey conducted by Carbon Trust concerning consumers' environmental awareness, 67% of them mentioned that they would purchase more readily a product with lower carbon emissions. Furthermore, the money-saving efficacy by adopting measures to reduce the carbon footprint and energy consumption in general is impressive. It's worth mentioning that in November 2013 the Carbon Trust helped customers save £ 5 billion and 53,5 Mt CO_2.

These figures are leading to the assessment of indicators such as consumers' environmental awareness and money saving by adopting measures to cut down carbon footprint and energy.

3.4 Socioeconomic problems

In general, there are a couple of problems regarding measuring socioeconomic factors of the selected food industries, and these are environmental awareness, financial externalities, carbon footprint and energy consumption. Regarding the latter (carbon footprint and energy consumption), as described extensively in other Deliverables, measuring the energy consumption of a factory is a demanding task with results that can be misleading, due to the fact that each factory consumes great amount of energy for communal processes. Nevertheless, this issue was targeted be installing meters in specific locations of JOTIS factory, in order to measure exactly the energy needed per product. Rising environmental awareness is also a difficult task. However, even with the best possible results, consumers, especially during a financial crisis, tend to buy cheap products that are not always the most "green" ones. Thus, it is very important to couple good environmental performance with low cost. However, most of the times this is extremely difficult due to low financial externalities. Factories for example do not always apply methods to save energy and lower their GHGe, due to the fact that there is no penalty in case they do not. However, this practice is expected to be decreased, mainly due to various policies that are under gradual implementation, such as mandatory energy audits, green label etc.

4 SELECTION AND IMPLEMENTATION OF SOCIOECONOMIC INDICATORS IN LIFE+ FOODPRINT PROJECT

As previously stated, the basic selection criteria was for the indicators to be effective, reliable easy to understand and to measure. Based on that, after consultations with partners, literature review and analyses of the data obtained from the food industry JOTIS, the following indicators have been selected:

1. Change in the number of employees in industry JOTIS, as a result of adopting measures to reduce the carbon footprint.
2. Economic cost of the adoption of methods aiming to reduce the carbon footprint.
3. Cost saving per ton of CO_2 eq. emissions reduction
4. Assessment of the number of consumers and stakeholders in the food industry who were informed about carbon footprint
5. Geographical proximity of suppliers, processing and retail outlets points
6. Economic cost for waste management
7. Employees' job satisfaction
8. Number of seminars regarding environmental issues to employees, per year.
9. % reduction in the use of natural resources by reducing energy use

Regarding the project's socioeconomic impact along the supply chain, the following indicators have been selected:

10. Number of ingredients (raw materials) with consumer labels
11. Number of products with consumer labels
12. Cost saving per ton of CO2 eq. emissions reduction from production of raw material
13. Cost saving per ton of CO_2 eq. emissions reduction from production of ingredients
14. Purchase intention to products that have reduced their carbon footprint

Please note that at a later stage of the project, these indicators will be evaluated for the food industry of Italy as well.

5 ACTION PLAN FOR THE QUANTIFICATION OF SOCIOECONOMIC INDICATORS

5.1 Data collection for the quantification of environmental indicators

The relevant methodology for each indicator calculation is presented next.

Table 9: Selected environmental indicators and relevant methodology.

No	Indicator	Methodology / Input Data Need
1	Change in the number of employees in industry JOTIS, as a result of adopting measures to reduce the carbon footprint.	Number per year (Data from Human Resources division)
2	Economic cost of the adoption of methods aiming to reduce the carbon footprint.	Euro / t CO2e (investments divided by emissions reductions)
3	Cost saving per tone of CO2 eq. emissions reduction	Euro / t CO2e (potential savings divided by emissions reductions)
4	Assessment of the number of consumers and stakeholders in the food industry who were informed about carbon footprint	Number per year (Data from marketing division)
5	Geographical proximity of suppliers, processing and retail outlets points	Km / t product
6	Economic cost for waste management	Euro / t waste
7	Employees' job satisfaction	Scale 1-10 (Data from Human Resources division)
8	Number of seminars regarding environmental issues to employees, per year.	Number per year
9	% reduction in the use of natural resources by reducing energy use	% reduction in Kwh / product
10	Number of ingredients (raw materials) with consumer labels	Data from marketing division
11	Number of products with consumer labels	Data from marketing division
12	Cost saving per ton of CO_2 eq. emissions reduction from production of raw material	Euro / t CO2e (potential savings divided by emissions reductions)

No	Indicator	Methodology / Input Data Need
13	Cost saving per ton of CO_2 eq. emissions reduction from production of ingredients	Euro / t CO2e (potential savings divided by emissions reductions)
14	Purchase intention to products that have reduced their carbon footprint	% increase per year (Data from marketing division)

5.2 Calculation of baseline socioeconomic indicators

THIS CHAPTER INCLUDES CONFIDENTIAL INFORMATION, AND HAS BEEN REMOVED

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