

Environmental sustainability and internationalization of the European food manufacturing industry



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Directors/Principal Investigators: Hurtado-Torres, N.E., Bermudez-Edo, M.C., Ortiz-de Mandojana, N., & Aragón-Correa, J.A.

Project Manager: Carolina Córcoles-Gil.

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Confederación Granadina de Empresarios

Granada, Andalucía and Spain are a great agri-food power. The industry associated to the primary sector, made up of more than 30,000 companies throughout the national territory, leads Spanish exports, generates almost half a thousand stable and quality jobs and has a specific weight in the economy of more than 2% of GDP.

The link to the natural environment of this industry, the largest in our economy, forces companies to take a step forward so as to reverse their environmental impact and minimize, as far as possible, the degradation of the habitats where they develop their activity. The commitment of companies to this objective is inalienable.

It is the companies, the large companies, but especially the small and medium-sized agri-food companies that compound the sector, which are making possible the transition towards more sustainable models of production and consumption. Companies are the ones introducing strategic changes to reduce their energy consumption, adopting energy efficiency measures and increasing the use of renewable energies; to be more efficient in the use of natural resources, reducing food waste; and to improve its circularity, reducing the environmental impact of food and beverage packaging.

Clearly, there is still room for improvement. Achieving the Sustainable Development Goals (SDGs) will require courageous actions from our companies, which are undoubtedly more than willing to show their responsibility and to act guided by a strong commitment to their environment. Companies, engines of wealth and employment, are also aware of their role in making the planet a fairer, healthier, and more durable place.

Companies are the absolute protagonists of the strategy towards the sustainability of the agri-food sector. They are also major players in the internationalization of our economy. The agri-food industry is an eminently exporting industry, but it still has great challenges ahead. Our companies, with their products of indisputable quality, have to improve their international competitiveness. For that purpose, it is essential to know in depth the market, the characteristics of the agri-food industries in the European Union and the rest of the world, and to develop strategic collaborations that allow our products and our companies to develop their full potential.



Maria Vera Zurita

GENERAL SECRETARY OF THE CGE

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Introduction

The purpose of this report, firstly, is to deepen our understanding of the European food manufacturing firms, identifying what their main characteristics are in terms of size, profitability, sales volume, geographical distribution and their evolution in the last ten years. Secondly, this report aims to assess the environmental sustainability of European food manufacturing firms, and thirdly, to understand the scope of their international operations.

Industries in the food manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. The industry groups are distinguished by the raw materials (generally of animal or vegetable origin) processed into food products. The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers. As classified under North American Industry Classification System (NAICS 311), the Food Manufacturing sector, consists of nine subsectors (see Table 1).

The selection of the sample of European food manufacturing is relevant due to three factors: its stability and resilience (Food Drink Europe, 2019), high ecological footprints and a growth in its internationalization activities.



Table 1. Food Manufacturing (NAICS 311) subsectors

NAICS	NAICS DESCRIPTION	SHORTENED DESCRIPTION	ACTIVITIES INCLUDED
3112	Animal food manufacturing	Animal food	Dog, cat, and other animal food manufacturing
3112	Grain and Oilseed Milling:	Grain/oilseed milling	Flour and rice milling; malt manufacturing; soybean and other oilseed processing; fats and oils refining; breakfast cereal manufacturing
3113	Sugar and Confectionery Product Manufacturing	Sugar and confectionery	Sugar manufacturing; chocolate manufacturing; other confectionery manufacturing
3114	Fruit and vegetable preserving and specialty food manufacturing	Fruit and vegetable	Milk, butter, cheese, and ice cream manufacturing
3115	Dairy product manufacturing	Dairy	Milk, butter, cheese, and ice cream manufacturing
3116	Animal slaughtering and processing	Meats	Animal slaughtering; meat processing; meat byproduct processing
3117	Seafood product preparation and packaging	Seafood	Seafood and seafood products manufacturing
3118	Bakeries and tortilla manufacturing	Bakeries and tortilla	Retail and commercial bakeries; frozen pastries manufacturing, cookie and cracker manufacturing; pasta and dough manufacturing, tortilla manufacturing
3119	Other food manufacturing	Other food	Nuts, peanut butter, coffee and tea, flavoring syrup, prepared sauce, spice and extract, and other miscellaneous food manufacturing

Source: Retrieved from Gaona, S. D., Pepping, T. J., Keenan, C., & DeVito, S. C. (2020). The Environmental Impact of Pollution Prevention, Sustainable Energy Generation, and Other Sustainable Development Strategies Implemented by the Food Manufacturing Sector. *Green Energy to Sustainability: Strategies for Global Industries*, 539-567.



1

First, the food industry is expected to grow at a compound annual growth rate of 2.6% in nominal terms between 2012 and 2025 over the world (Statista Consumer Market Outlook, 2020). Moreover, food industry generated a total revenue of US\$6,954 billion in 2019 (Statista Consumer Market Outlook, 2020). At European level, food industry is the largest sector of manufacturing in terms of turnover, value added, as well as employment. Its share in manufacturing industry turnover totals 15 % (Tuzová, Toullová, Kubíčková, 2017). Furthermore, it is the only manufacturing sector in the European Union whose production did not decrease dramatically during the 2008 crisis. In the same vein, despite uncertainties posed by Covid-19, Food & nonalcoholic beverage is the only industry of the economy projected to post positive growth in 2020 (Euromonitor, 2020).

2

Second, the importance of reducing negative environmental impact of food industry increasingly recognized (Christopher, Trott, Hende, & Hultink, 2020; Williams & Wikstrom, 2011). Food products are consumed on a daily basis and often have a short shelf life. Global food consumption is responsible for 20–30% of the environmental burdens of total consumption, with meat products and dairy products sharing a major part of the total environmental impacts (Notarnicola, Tassielli, Renzulli, Castellani, & Sala, 2017). At European level, the food industry is responsible for around 20–30% of the environmental impacts of consumption across the EU (Trott & Simms, 2017; Tukker & Jansen, 2006).

3

Third, a trend towards internationalization has been noticeable among European food manufacturing firms. Within this industry, firms access to international markets primarily through exportations (Azar, 2010). In 2019, all over the world, as well as over euro area, nearly 9.6 % of total merchandise exports were products of the food industry (World Bank, 2019).

“THE FOOD INDUSTRY IS EXPECTED TO GROW AT A COMPOUND ANNUAL GROWTH RATE OF 2.6% IN NOMINAL TERMS BETWEEN 2012 AND 2025 OVER THE WORLD (STATISTA CONSUMER MARKET OUTLOOK, 2020).”

“AT EUROPEAN LEVEL, THE FOOD INDUSTRY IS RESPONSIBLE FOR AROUND 20-30% OF THE ENVIRONMENTAL IMPACTS OF CONSUMPTION ACROSS THE EU (TROTT & SIMMS, 2017; TUKKER & JANSEN, 2006).”



Thus, in this report, we shed light on key characteristics of European food manufacturing industry, its environmental impact and internationalization behavior. We have evidenced that the European food manufacturing is characterized by the presence of small enterprises. As we have seen, one of the main characteristics of the European food manufacturing is localization and specialization; in fact, there is a strong presence of firms in Italy, Romania and Russia. In terms of specialization, a correct evaluation of the structure of the European food manufacturing reveals that almost half of firms belong to Bakeries & Tortilla Manufacturing subsector.

The statistic shows that profitability of European food manufacturing firms increased between 2011 and 2019. Regarding environment impact, the collected data shows that a very large firms in food manufacturing industry reflect higher environmental risk than small ones. Interestingly, the French manufacturing firms ranks above the European average in resource use, emissions and environmental innovation. In terms of firms' international operations, developed emerging EMEA represents the largest portion of international sales of European food manufacturers.



Methodology

Our sample was chosen from two different databases: (1) Orbis–Bureau van Dijk; (2) Thomson Reuters Eikon.

The Orbis–Bureau van Dijk database has been used to select the initial sample, considering that it is one of the largest company databases, covering more than 300 million firms worldwide (Iwasaki & Byung-Yeon Kim, 2020). From this dataset, we sought out firms that satisfy four conditions. First, from an operational view, we considered only firms with active status. Second, the geographical area on which the analysis would have been conducted was selected. The five large European regions were considered, which refers to Western Europe, Eastern Europe, Scandinavia, Baltic and Nordic countries. Third, an industry criteria was applied, so we selected only firms belonging to Food Manufacturing industry with NAICS code of 311. Fourth, we filtered the sample taking into consideration only firms with ultimate owners by profile with min. path of 50.01 percent, known or unknown shareholder. We found a total of 197,293 European Manufacturing firms that met these four conditions. Table 2 illustrates the selection criteria adopted to form the sample are shown.



Table 2. Sample selection criteria

Nº	FILTER	SELECTED OPTIONS	Nº FIRMS
1	Status	Active firms	276,950,160
2	Region	Western Europe, Eastern Europe, Scandinavia, Baltic countries, Nordic countries	71,860,357
3	NAICS code	311- Food Manufacturing	583,330
4	Subsidiaries with ultimate owners by profile	UO; GUO and DUO; Def. of the UO: min. path of 50.01%, known or unknown shareholder	197,293
	Total		197,293

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

From Orbis-Bureau van Dijk dataset, we collect data about firms' key indicators in terms of size, profitability, sales volume, and environmental risk metrics. It is important to note that that some indicators presented missing data for particular firms.

Thomson Reuters Eikon database was consulted to gather data on additional relevant environmental indicators and scope of internationalization operations. This source of data offers a comprehensive platform for establishing customizable benchmarks for the assessment of firms' operating behavior, environmental management and financial performance (Ellimäki, Gómez-Bolaños, Hurtado-Torres, & Aragón-Correa, 2019). Thomson Reuters Eikon provides an accurate and reliable information (Cheng, Ioannou, & Serafeim, 2014) and investment analysis tools for professional investors (Gómez-Bolaños, Hurtado-Torres, & Delgado-Márquez, 2019). The sample of listed firms was reduced significantly when we analyzed some essential indicators that are only available in Thomson Reuters Eikon. In this database, we identified the environmental and internationalization information of 304 firms from 35 European countries and all nine food manufacturing subsectors. Table I and II (in the appendix) show the description of the sample extracted from Thomson Reuters Eikon.

Description of European food manufacturing firms

The aim of this section is to describe relevant characteristics of European food manufacturing firms, in terms of size, subindustry, profitability, sales volume, geographical distribution and their financial evolution in the last ten years. Table 3 reports the distribution of food manufacturing firms included in the Orbis- Bureau van Dijk database by size and country.

In this report, we consider the firm size classification according to Orbis- Bureau van Dijk:



Very large (VL)

Firms are considered to be very large when they match at least one of the following conditions: operating revenue \geq 130 million USD, total assets \geq 260 million USD, and number of employees \geq 1,000.

Large (L)

Firms are considered to be large when they match at least one of the following conditions: operating revenue \geq 13 million USD, total assets \geq 26 million USD, and number of employees \geq 150.

Medium (M)

Firms are considered to be medium sized when they match at least one of the following conditions: operating revenue \geq 1.3 million USD, total assets \geq 2.6 million USD, and number of employees \geq 15.

Small (S)

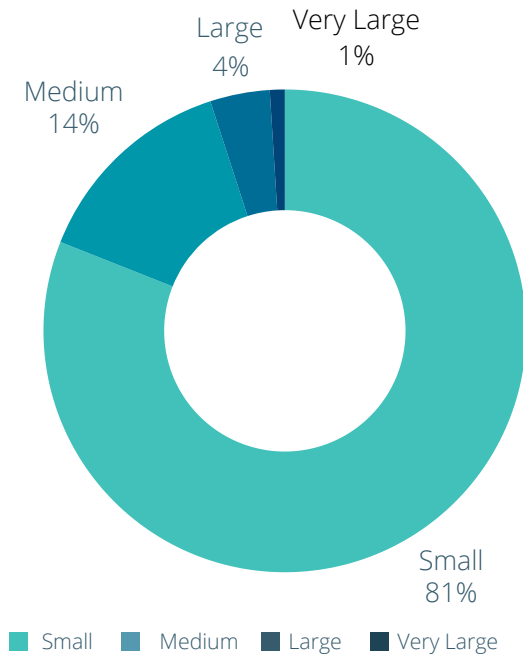
Firms are considered to be small when they are not included in another category.

Table 3. Number of firms per size and country

COUNTRY	SIZE CLASSIFICATION				TOTAL
	VL	L	M	S	
Italy (IT)	156	802	2707	28996	32661
Russia (RU)	143	1174	4583	16181	22081
Romania (RO)	23	179	1186	16519	17907
United Kingdom (GB)	284	660	1032	13368	15344
Serbia (RS)	36	108	841	12954	13939
Ukraine (UA)	71	301	890	11163	12425
Bulgaria (BG)	5	106	910	11348	12369
Germany (DE)	195	792	3216	5996	10199
Poland (PL)	88	580	2311	5220	8199
Spain (ES)	143	638	1807	3917	6505
France (FR)	241	950	1464	2568	5223
Moldova (MD)	11	27	126	4130	4294
Portugal (PT)	19	159	632	3278	4088
Turkey (TR)	63	383	1125	1467	3038
Czechia (CZ)	26	151	440	2265	2882
Norway (NO)	64	234	428	1981	2707
Netherlands (NL)	95	164	668	1262	2189
Slovakia (SK)	8	51	189	1811	2059
Macedonia (MK)	6	8	145	1892	2051
Austria (AT)	28	103	479	970	1580
Kosovo (KV)	0	3	38	1528	1569
Croatia (HR)	16	46	169	1181	1412
Belgium (BE)	71	242	209	703	1225
Slovenia (SI)	6	24	98	1051	1179
Denmark (DK)	40	46	154	786	1026
Ireland (IE)	11	52	183	715	961
Letonia (LV)	1	22	124	792	939
Albania (AL)	1	8	23	880	912
Estonia (EE)	3	35	101	739	878
Finland (FI)	20	65	154	589	828
Sweden (SE)	28	119	262	346	755
Hungary (HU)	14	58	204	454	730
Switzerland (CH)	5	54	270	317	646
Greece (GR)	16	106	199	45	366
Bosnia-Herzeg. (BA)	13	28	99	164	304
Cyprus (CY)	4	7	25	266	302
Iceland (IS)	2	31	60	187	280
Montenegro (ME)	6	5	19	246	276
Lithuania (LT)	10	45	115	40	210
Belarus (BY)	23	86	22	9	140
Luxembourg (LU)	0	6	15	77	98
Malta (MT)	1	3	19	20	43
Liechtenstein (LI)	2	0	1	0	3
Total	1998	8661	27742	158421	196822

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

GRAPH 1. PERCENT OF FIRMS PER SIZE



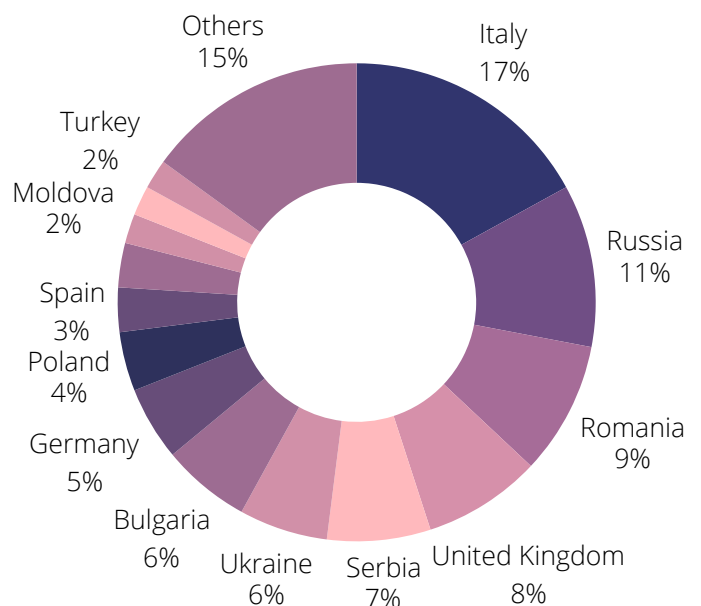
Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Graph 1 shows the percent of firms per size. It can be noted that the very large and large firms do not exceed 4% of the total of active firms, compared with 95 % of small and medium firms.

In terms of geographical distribution, our sample comprises firms from 43 different European countries. The country with the greatest number of food manufacturing firms is Italy (32661), followed by Russia (22081). In contrast, Liechtenstein has the smallest number of food manufacturing firms (3), followed by Malta (43) and Luxembourg (98). Graph 2 reflects that that the main part of our sample (about 76%) is made up from 10 countries: Italy, Russia, Romania, United Kingdom, Serbia, Ukraine, Bulgaria, Germany, Poland, Spain.

“(ABOUT 76%) IS MADE UP FROM 10 COUNTRIES: ITALY, RUSSIA, ROMANIA, UNITED KINGDOM, SERBIA, UKRAINE, BULGARIA, GERMANY, POLAND, SPAIN.”

GRAPH 2. PERCENT OF FIRMS PER COUNTRY



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Table 4. Number of firms per size and subsector

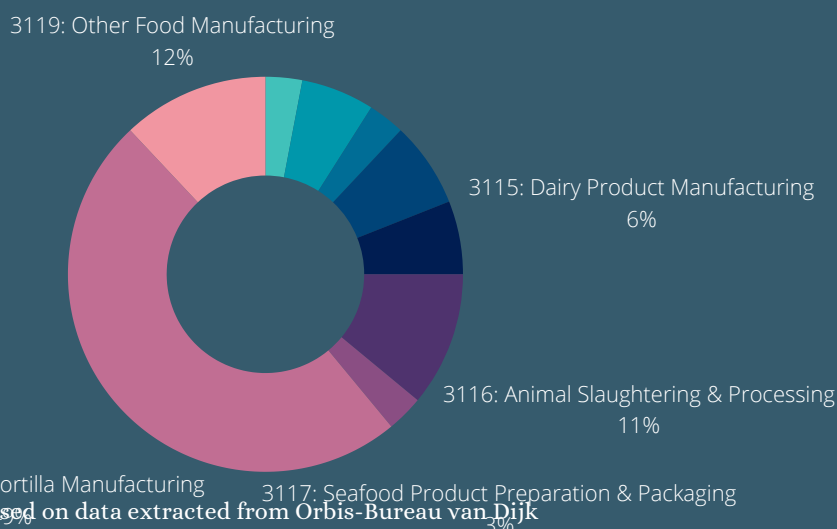
	SIZE CLASSIFICATION				GRAND TOTAL
	VL	L	M	S	
3111: Animal Food Manufacturing	162	665	1194	3833	5854
3112: Grain and Oilseed Milling	230	860	1944	9539	12573
3113: Sugar & Confectionery Product Manufacturing	163	444	937	3668	5212
3114: Fruit & Vegetable Preserving & Specialty Food Manufacturing	160	759	1946	10019	12884
3115: Dairy Product Manufacturing	287	936	2052	7846	11121
3116: Animal Slaughtering & Processing	382	1724	5226	14997	22329
3117: Seafood Product Preparation & Packaging	89	431	1111	3367	4998
3118: Bakeries & Tortilla Manufacturing	206	1623	10032	84248	96109
3119: Other Food Manufacturing	315	1195	3219	19817	24546
Total	1994	8637	27661	157334	195626

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

It should be noted that the firm size from different subsectors follow the same size pattern as global food manufacturers. As shown in Table 4, very large firms present a tiny proportion across subsectors (between 4.5% and 19%). In contrast, medium and small firms account for a significant percentage of sample across subsectors (between 2,4% and 51%).

Graph 3 provides details on percent of firms per subsectors. The one that has greater weight is “Bakiers and Tortilla Manufacturing”, counting on 49% of the total and in second place is the “Other Food Manufacturing” with 12%.

GRAPH 3. PERCENT OF FIRMS PER SUBSECTOR



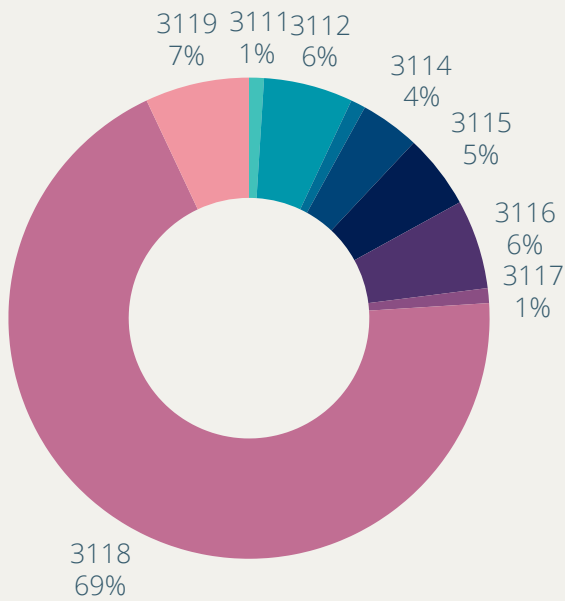
Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Table 5. Firms by country and subsector

COUNTRY	NICS 2017									TOTAL
	3111	3112	3113	3114	3115	3116	3117	3118	3119	
Italy (IT)	251	1953	350	1146	1769	2039	317	22540	2100	32465
Russia (RU)	966	2062	785	1287	2325	3616	1499	6913	2625	22078
Romania (RO)	286	993	351	1784	910	1302	74	10623	1584	17907
United Kingdom (GB)	587	517	782	902	796	1163	241	5534	4822	15344
Serbia (RS)	407	630	274	1669	545	1226	71	7732	1385	13939
Ukraine (UA)	356	1965	267	720	701	1670	328	5591	827	12425
Bulgaria (BG)	148	276	225	502	452	603	61	8527	1575	12369
Germany (DE)	501	425	314	401	401	2521	116	3665	1815	10159
Poland (PL)	294	442	216	718	311	1532	196	3554	936	8199
Spain (ES)	263	431	160	397	358	1055	236	2676	929	6505
France (FR)	231	242	247	209	371	958	130	2308	527	5223
Moldova (MD)	40	768	46	829	120	704	88	1562	137	4294
Portugal (PT)	67	213	87	195	218	461	122	2441	284	4088
Turkey (TR)	152	387	217	371	304	161	15	995	436	3038
Czechia (CZ)	158	128	41	57	74	361	11	710	427	1967
Norway (NO)	76	73	67	106	101	318	426	1196	344	2707
Netherlands (NL)	152	87	95	122	161	249	78	796	449	2189
Slovakia (SK)	208	108	62	201	53	192	3	451	781	2059
Macedonia (MK)	27	75	41	148	105	67	2	1283	303	2051
Austria (AT)	53	92	18	78	62	371	8	682	185	1549
Kosovo (KV)	20	74	32	85	106	128	4	1001	119	1569
Croatia (HR)	23	78	22	99	83	156	29	770	152	1412
Belgium (BE)	69	50	91	68	73	140	12	573	149	1225
Slovenia (SI)	15	65	21	61	69	170	4	641	133	1179
Denmark (DK)	38	40	48	73	39	66	74	430	218	1026
Ireland (IE)	165	39	20	26	67	176	29	300	139	961
Letonia (LV)	43	24	33	100	38	123	84	318	176	939
Albania (AL)		62	24	27	118	58	424	169	30	912
Estonia (EE)	18	30	53	97	42	76	62	295	205	878
Finland (FI)	45	35	25	78	35	93	49	298	170	828
Sweden (SE)	21	28	39	55	26	130	43	298	115	755
Hungary (HU)	37	32	50	75	37	93	3	319	84	730
Switzerland (CH)	29	32	51	24	83	97	5	191	134	646
Greece (GR)	23	41	9	87	47	35	8	64	52	366
Bosnia-Herzeg. (BA)	26	26	9	34	25	62	1	83	38	304
Cyprus (CY)	9	13	10	10	27	27	1	189	16	302
Iceland (IS)	20	6	5	4	12	19	119	34	61	280
Montenegro (ME)	5	3		7	13	17	1	210	20	276
Lithuania (LT)	15	14	13	15	11	36	20	57	29	210
Belarus (BY)	6	11	11	12	26	29	3	18	24	140
Luxembourg (LU)	1	1			4	19		65	7	97
Malta (MT)	2	2	1	4	3	9	1	7	4	33
Liechtenstein (LI)	1			1		1				3
Total	5854	12573	5212	12884	11121	22329	4998	96109	24546	195626

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

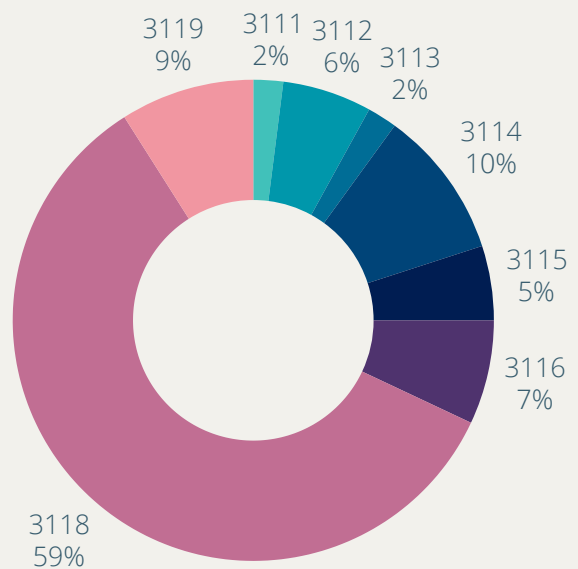
GRAPH 4. PERCENT OF ITALIAN FOOD MANUFACTURING FIRMS PER SECTOR



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

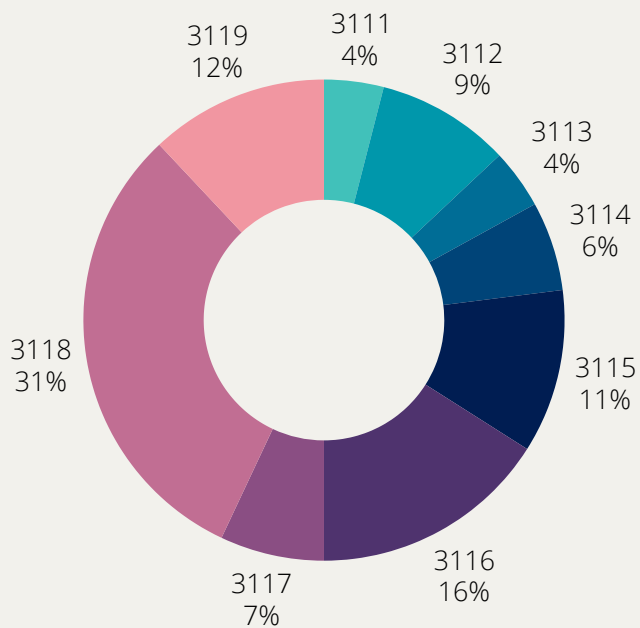
Table 5 illustrates number of firms per country and subsectors of food manufacturing. The largest number of food manufacturing firms could be found in Italy, Russia and Romania, with 32465, 22078, and 17907 respectively. Food manufacturing was less well-represented in Malta, with 33 firms, and in Liechtenstein, where the total number of food manufacturing firms amounted to 3 – the lowest of the total sample.

GRAPH 5. PERCENT OF ROMANIAN FOOD MANUFACTURING FIRMS PER SECTOR



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

GRAPH 6. PERCENT OF RUSSIAN FOOD MANUFACTURING FIRMS PER SECTOR



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Graph 4 shows that Italian food manufacturers are highly concentrated among Bakeries and Tortilla Manufacturing firms (69%).

Similarly, a large majority of Romanian food manufacturing firms (59%) is specialized in manufacturing bakery products and tortillas.

In contrast, the Russian food manufacturing industry is highly fragmented as it can be seen in Graph 6. The main manufacturers are: Bakeries and Tortilla Manufacturing (31%), Animal Slaughtering and Processing (16%), Other Food Manufacturing (12%) and Animal Food Manufacturing (11%).

Table 6. Firms' turnover average per country (thousand USD)

COUNTRY	YEAR 2019			YEAR 2015			YEAR 2011		
	N° FIRMS ¹	AVERAGE	SD	N° FIRMS	AVERAGE	SD	N° FIRMS	AVERAGE	SD
Italy (IT)	17801	4249.91	50018.01	6759	11485.21	120664.96	4089	19000.22	152983.7
Russia (RU)	15510	4366.75	39081.64	11883	3831.48	33279.1	3755	13368.17	79685.67
Romania (RO)	10122	958.04	8910.82	6539	1230.97	9149.56	4737	1623.76	11661.87
Bulgaria (BG)	4749	1046.09	9068.98	5337	700.9	5718.77	4869	692.18	5454.76
Serbia (RS)	4446	1305.12	7816.21	1697	2462.55	11271.14	666	6317.4	19339.56
Portugal (PT)	2229	4345.51	23088.16	2196	4093.67	22835.75	1684	5637.78	27808.89
Ukraine (UA)	2062	6951.34	39272.47	2366	4224.51	28966.05	2148	6118.7	43800.63
Spain (ES)	1757	18554.28	93784.98	3890	15321.49	75621.3	3323	17177.84	84861.5
Macedonia (MK)	1396	397.77	3052.48	992	403.08	2145.57	3	30763.28	19177.95
Norway (NO)	1324	17684.83	95684.26	1143	16473.55	73416.7	875	21759.94	84715.39
France (FR)	1232	65914.82	314520.1	3144	37838.19	211980.29	3556	31777.25	214834
Croatia (HR)	1057	4736.04	37446.49	727	5650.4	40763.45	405	9993.68	56832.9
Slovakia (SK)	1004	2840.46	13877.46	759	3714.3	16620.18	476	6204.59	23833
Slovenia (SI)	866	1844.82	12116.29	688	2530.09	13896.11	434	4324.06	20012.84
Letonia (LV)	720	1111.18	6203.57	574	1372.1	6074.21	344	1917.58	6062.06
Germany (DE)	699	45489.22	305038.3	1733	54364.18	290894.62	983	68995.21	426464.7
Sweden (SE)	614	16710.82	63443.25	603	22507.81	102603.33	506	27623.12	125395.4
United Kingdom (GB)	564	163355.9	1180061	988	158063.29	959764.19	845	155448.9	893579.6
Finland (FI)	542	17157.4	106783.9	514	18723.97	113951.14	415	26720.26	177709.5
Czechia (CZ)	467	10880.65	39124.29	1419	6991.32	31310.07	966	10538.87	41362.94
Hungary (HU)	359	12846.64	60717.6	561	7795.31	37922.65	401	10613.71	47425.58
Belgium (BE)	349	99412.8	310458.3	404	72906.02	214664.24	384	85293.51	258110.6
Estonia (EE)	332	3584.38	15107.45	432	3256.45	12497.11	275	5060.54	16887.61
Iceland (IS)	182	4655.11	20917.55	66	13454.21	32132.36	61	8827.91	24059.18
Denmark (DK)	136	86710.94	161618.1	93	102002.78	129865.34			
Lithuania (LT)	101	28761.46	74266.32	192	13913	43140.92	167	14229.3	42152.22
Austria (AT)	92	60425.98	300809.5	314	35192.88	167167.23	162	68200	289594.7
Turkey (TR)	80	107847.5	233429.7	445	39256.34	146902.92	301	51698.79	163397.3
Greece (GR)	73	36519.35	65651.56	332	15887.15	41032.3	343	17988	53827.61
Bosnia-Herzeg. (BA)	70	12850.62	21472.2	227	4520.93	11913.07	258	3384.13	7816.31
Netherlands (NL)	55	668463.5	1552042	134	399809.9	1009350.6	118	485905.7	1215497
Montenegro (ME)	38	4861.06	12241.3	49	3110.79	9213.02	10	9583.67	16885.49
Ireland (IE)	17	20723.69	20519.66	55	26738.05	47222.5	31	36236.29	43251.72
Luxembourg (LU)	8	25879.38	29988.8	13	18244.27	23178.68	12	13773.3	18785.83
Poland (PL)	7	161871.7	269849.6	1082	23122.83	68800.97	827	27022.17	73898.71
Switzerland (CH)	4	4106412	2546247	350	49101.17	421159.18	466	72404.94	372043.4
Cyprus (CY)	2	1045449	1436665	11	121476.26	384877.83	4	346538.8	662059.2
Liechtenstein (LI)	2	343937.2	252694.6	1	191512.96		1	170050	
Malta (MT)	1	0		33	7657.07	19957.87	28	6677.41	16802.25
Albania (AL)				7	3408.02	6676.51	2	1227.44	1174.77
Belarus (BY)				35	39783.88	34592.41	32	31080.09	29628.73
Kosovo (KV)				7	10026.26	7015.2			
Moldova (MD)				644	1057.63	4912.85	19	13613.99	22302.25
Total	71069	8669.22	140704.5	59438	14023.75	166846.7	38981	20311.09	198953.5

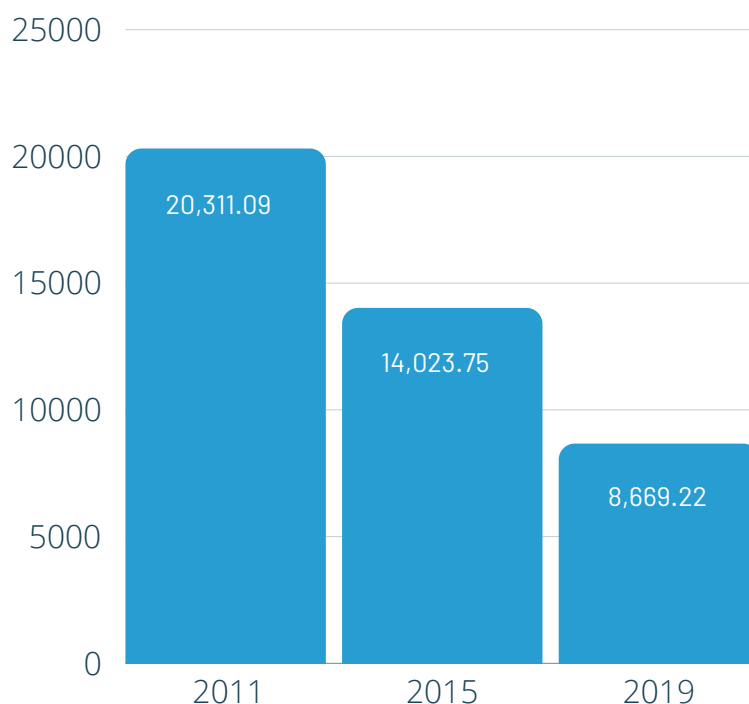
¹ A substantial decrease in the N° Firms of some countries for 2019 is due to the fact that information is not yet available for all firms.

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Table 6 compares changes in Food manufacturing firms' turnover average between different European countries in the period from 2011 to 2019. Although, in 2019, nearly 40% of the food manufacturers were active in Italy, Russia, and Romania, firms from these countries were not with the highest turnover (\$3191.57 thousand). In 2019, Swiss firms led the ranking with an average turnover of \$4.106.412 thousand.

As it can be observed in Graph 7, average turnover of European Food Manufacturing firms has been steadily declining since 2011, when it was as high as \$20311.09 thousand. In 2019, firms' turnover amounted to \$ 8669.22 thousand.

GRAPH 7. FIRMS' TURNOVER AVERAGE (THOUSAND USD)



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Table 7 shows the return on equity (ROE) of European food manufacturing firms from 2011 to 2019. The ROE is a measure calculated by dividing the net income of a firm by its equity over a specific period. This ratio is used to measure how profitable a firm is. In 2019, the highest ROE of food manufacturing firms was recorded in Romania, with an average value of 48.83, and the lowest in Sweden with a negative value of 12.67.

As it can be seen in Graph 8, firms' ROE has increased slightly over the period considered. It can be seen that, in 2011, ROE registered the lowest value of 13.75% and increasing to 27.13% in 2015. In 2019, this ratio registered a highest value of 29.83%. This indicate that profitability of European food manufacturing firms increased between 2011 and 2019.

"THE HIGHEST ROE OF FOOD MANUFACTURING FIRMS WAS RECORDED IN ROMANIA, WITH AN AVERAGE VALUE OF 48.83, AND THE LOWEST IN SWEDEN WITH A NEGATIVE VALUE OF 12.67."

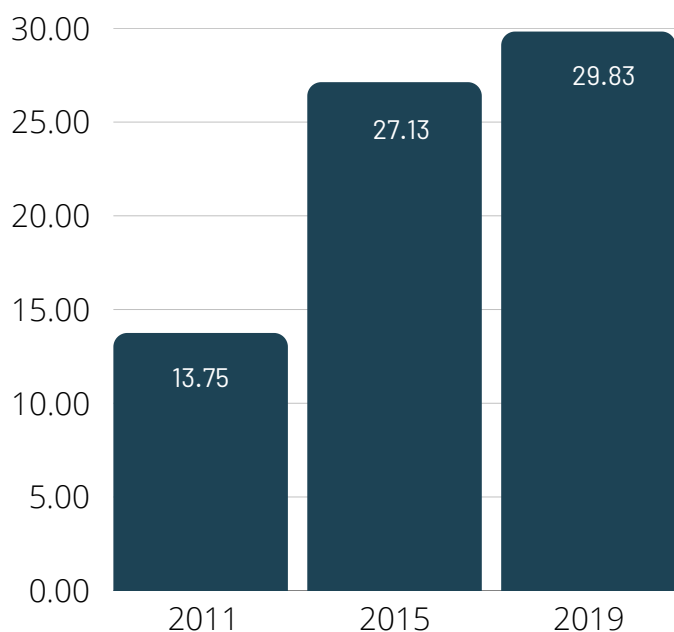
Table 7. Firms' ROE average per country (thousand USD)

COUNTRY	YEAR 2019			YEAR 2015			YEAR 2011		
	N° FIRMS ¹	MEAN	SD	N° FIRMS	MEAN	SD	N° FIRMS	MEAN	SD
Russia (RU)	11902	48.72	130.15	9334	58.33	139.93	3144	42.9	119.62
Romania (RO)	5119	48.83	98.68	3185	47.14	108.41	2324	14.58	103.76
Italy (IT)	3980	9.35	89.95	5043	14.64	98.18	3672	8.84	83.72
Serbia (RS)	3383	39.5	131.35	1272	16.18	88.07	611	15.2	83.82
Bulgaria (BG)	2869	27.53	79.89	2611	26.13	80.79	1788	14.94	79.55
Portugal (PT)	1694	4.57	85.49	1590	3.21	93.04	1360	-5.53	94.2
Ukraine (UA)	1610	20.48	98.76	1786	24.99	85.56	1635	14.69	107.17
Spain (ES)	1604	10.39	73.08	3426	10.18	78.98	2950	2.66	71.53
France (FR)	1116	16.24	76.93	2885	15.64	73.64	3261	12.36	76.9
Norway (NO)	1067	18.8	113.56	978	25.61	110.74	778	19.58	97.12
Macedonia (MK)	893	-1.7	84.54	823	1.62	91.55	3	11.54	5.09
Slovakia (SK)	778	-2.35	103.3	543	-0.82	119.87	318	-15.22	132.84
Croatia (HR)	746	20.91	85.34	542	26.68	70.21	322	21.3	69.01
Belgium (BE)	732	19.68	72.7	687	13.31	86.62	618	8.78	77.35
Slovenia (SI)	710	25.67	122.9	584	19.75	110.53	396	11.34	96.7
Denmark (DK)	587	8.55	104.37	398	10.39	107.84			
Sweden (SE)	575	-12.67	158.19	578	4.18	128.25	482	4.69	115.71
United Kingdom (GB)	491	16.64	110.92	866	25.03	85.27	762	20.05	81.18
Finland (FI)	418	14.96	119.76	408	22.86	116.85	356	24.77	98.15
Letonia (LV)	383	24.35	118.21	302	23.19	118.47	215	3.21	112.4
Hungary (HU)	345	15.58	52.15	502	14.41	69.13	375	0.73	84.28
Czechia (CZ)	332	10.53	52.53	824	12.59	80.49	651	2.91	78.85
Estonia (EE)	332	9.49	68.19	424	8.65	111.15	280	3.04	77.58
Iceland (IS)	115	12.34	62.42	141	4.3	59.17	117	6.42	125.96
Netherlands (NL)	114	14.52	50.01	237	31.17	75.37	226	26.31	83.98
Germany (DE)	110	41.77	100.85	557	31.42	95.11	615	32.43	119.9
Lithuania (LT)	101	14.44	20.23	138	21.24	39.88	131	-1.74	53.96
Greece (GR)	71	9.07	18.39	312	-1.82	78.87	331	-1.47	52.16
Bosnia-Herzeg. (BA)	67	7.3	24.42	189	5.98	105.9	213	6.6	105.02
Austria (AT)	46	-3.14	113.51	143	11.9	89.51	115	37.8	115.2
Turkey (TR)	35	1.94	49.13	414	12.18	60.66	271	9.69	48.81
Montenegro (ME)	30	6.54	42.13	39	-6.52	121.59	10	10.49	19.78
Ireland (IE)	13	29.54	66.21	67	16.76	26.55	56	17.25	106.11
Luxembourg (LU)	6	13.88	11.98	9	41.75	81.61	8	35.58	52.13
Poland (PL)	6	7.31	18.46	977	12.17	78.04	743	8.47	74.98
Switzerland (CH)	4	11.79	5.23	5	14.36	3.32	5	12.6	10.23
Cyprus (CY)	2	8.88	9.37	8	27	37.04	4	8.93	14
Albania (AL)				2	11.92	2.6			
Belarus (BY)									
Kosovo (KV)				7	6.31	29.5			
Liechtenstein (LI)									
Moldova (MD)				10	-21.33	54.29	14	2.52	15.42
Malta (MT)				26	9.55	25.13	22	7	16.98
Total	42386	29.83	109.72	42872	27.13	105.93	29182	13.75	92.91

¹ A substantial decrease in the N° Firms of some countries for 2019 is due to the fact that information is not yet available for all firms.

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

GRAPH 8. FIRMS' ROE AVERAGE



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Table III (in the appendix) reports key characteristics of top 100 big European food Manufacturing firms. Regarding the 10 largest European food manufacturers ranked by number of employees were Western Europe firms, excepting Cypriot one (see Table 11). In terms of sector, Other Food Manufacturing (NAICS 3119) and Dairy Product Manufacturing (NAICS 3115) represents more than a half of firms (60%). The rest of firms belong to Sugar & Confectionery Product Manufacturing (NAICS 3113) and Animal Slaughtering & Processing (NAICS 3116). The firms' employee numbers amounted to roughly 38,279 in 2015 and rose to 42,556 in 2019. Moreover, firms generated turnovers of \$7,187,325 thousand in 2015, and climbed up to \$7,531,601 thousand in 2019. Similarly, ROE registered a positive value of 7 % in 2015, and then increased slightly, reaching 12% in 2019.

In addition, it can be observed that some firms present similar characteristics in terms of sector, employee number and financial indicators. This can be explained by the fact that they are owned by the same parent company (global ultimate owner). As in case of the British firms, Associated British Foods and Wittington Investments, owned by Garfield Weston Foundation. Another case is Groupe Familial Fievet - Bel as a global ultimate owner of French firms: Unibel and Bel.

Table 8. Top 10 Big firms

FIRM	COUNTRY	NAICS	YEAR 2019			YEAR 2015		
			EMPLOYEE NUMBER	TURNOVER	ROE	EMPLOYEE NUMBER	TURNOVER	ROE
WITTINGTON INVESTMENTS LIMITED	United Kingdom (GB)	3119	139,570	19,589,529	11.35	125,166	20,005,694	9.48
ASSOCIATED BRITISH FOODS PLC	United Kingdom (GB)	3119	138,097	19,292,386	12.28	124,036	19,736,387	10.86
MHP SE	Cyprus (CY)	3116	31,427	2,061,324	15.5	30,900	1,281,631	-24.69
BOPARAN HOLDCO LIMITED	United Kingdom (GB)	3116	20,746	3,333,942	-	22,974	4,885,251	-
SAVENCIA SA	France (FR)	3115	20,031	6,162,732	8.24	18,911	5,335,324	7.97
SUEDZUCKER AG	Germany (DE)	3113	19,188	7,409,692	0.24	16,486	7,048,347	5.07
JACOBS DOUWE EGBERTS B.V.	Netherlands (NL)	3119	16,973	6,821,284	8.73	9,110	4,305,325	-2.75
PERFETTI VAN MELLE GROUP B.V.	Netherlands (NL)	3113	14,654	2,993,972	34.86	13,488	2,853,244	20.01
UNIBEL	France (FR)	3115	12,438	3,825,802	9.46	10,861	3,210,909	17.9
BEL	France (FR)	3115	12,438	3,825,348	10.09	10,861	3,211,135	17.61

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Environmental sustainability of European food manufacturing firms

1.1. Concepts and definitions of environmental sustainability measurement

This section provides information relating to environmental sustainability in European food manufacturing firms. Environmental sustainability refers to “firm’s capacity to effectively manage and control the harm done to the natural environment by its processes, products and business activities in general” (Pogutz, Micale, & Winn, 2011). The firms’ environmental sustainability can be measured through emission reduction, waste elimination, or resource conservation (Aragón-Correa, Marcus, & Hurtado-Torres, 2016; Hartmann & Vachon, 2018; Sharfman, Shaft, & Tihanyi, 2004). In this report, we acquired environmental sustainability measurement data from Trucost Rating of Orbis-Bureau van Dijk, which has been commonly used by scholars in academic research (e.g. Cho, Cho, & Lee, 2018; Delmas, Niarn-Birch, & Lim 2015; Delmas, Etzion, Nairn-Birch, 2013). We also compiled environmental performance data for a reduced sample, using data provided by Thomson Reuters Eikon database. The indicators developed by Thomson Reuters on environmental issues has been widely used in prior studies (Bueno-Garcia, Ortiz-Perez, & Mellado-Garcia, 2020; Ellimäki et al., 2019). Table 9 present environmental indicators employed in this report, its definitions and source from which was extracted.



Table 9. Environmental indicators, definitions and data source

FIRM	COUNTRY	NAICS
Trucost environmental rating-current	Environmental score represents the potential percentage of revenue at risk from the total environmental costs of its firm activities. Score is expressed in percentage of turnover but may actually exceed 100%.	Orbis-Bureau van Dijk
Trucost Greenhouse Effect (%)	Greenhouse score represents the potential percentage of revenue at risk from the greenhouse costs of firm activities.	Orbis-Bureau van Dijk
Trucost Water (%)	Water usage score represents the potential percentage of revenue at risk from the water usage costs of firm activities.	Orbis-Bureau van Dijk
Trucost Waste (%)	Waste score represents the potential percentage of revenue at risk from the waste costs of firm activities.	Orbis-Bureau van Dijk
Trucost Air pollutants (%)	Air pollutants score represent the potential percentage of revenue at risk from the air pollutants costs of firm activities.	Orbis-Bureau van Dijk
Trucost Land and water pollutants (%)	Land and water pollutants score represent the potential percentage of revenue at risk from the land and water pollutants costs of firm activities.	Orbis-Bureau van Dijk
Trucost Natural Resources used (%)	Natural resources used score represent the potential percentage of revenue at risk from the natural resources used costs of firm activities.	Orbis-Bureau van Dijk
Resource Use Score	Resource use category score reflects a company's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.	Thomson Reuters Eikon
Emissions Score	Emission category score measures a company's commitment and effectiveness towards reducing environmental emission in the production and operational processes.	Thomson Reuters Eikon
Environmental Innovation Score	Environmental innovation category score reflects a company's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.	Thomson Reuters Eikon

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

1.2. Environmental Trucost Rating of European food manufacturing firms

In this subsection, we analyze environmental data extracted from Orbis database. Environmental Trucost Rating cover both direct and supply chain activities, such as emissions and waste production, water abstraction, natural resource use, and raw materials extraction (Delmas et al., 2015). Trucost quantifies the various environmental impacts and damage costs associated with extractions and emissions using methodologies developed in the environmental economics literature, which are vetted by an independent academic advisory panel (Delmas et al., 2013). The metric is based on six categories of corporate environmental impacts: greenhouse gases, water usage, waste, air pollutants, land and water pollutants, and natural resources used (Trucost, 2013).

Table IV and V (in the appendix) provide information about top 100 firms with low environmental risk and high environmental risk respectively.

The average of environmental rating per firm size is depicted in Table 10. It shows that, globally, a very large firms in food manufacturing industry reflects higher environmental risk than small ones.

“GLOBALLY, A VERY LARGE FIRMS IN FOOD MANUFACTURING INDUSTRY REFLECTS HIGHER ENVIRONMENTAL RISK THAN SMALL ONES”.

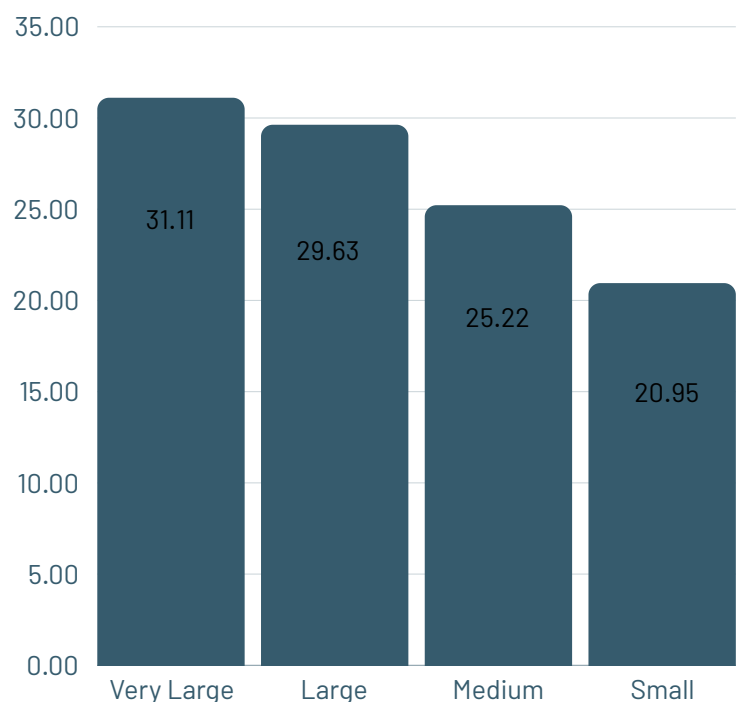
Table 10. Average of environmental rating per firm size

SIZE	TRUCOST ENVIRONMENTAL RATING - CURRENT	TRUCOST GREENHOUSE EFFECT (%)	TRUCOST WATER (%)	TRUCOST WASTE (%)	TRUCOST AIR POLLUTANTS (%)	TRUCOST LAND AND WATER POLLUTANTS (%)	TRUCOST NATURAL RESOURCES USED (%)
VL	31.11	4.34	18.01	0.13	2.45	5.99	0.20
L	29.63	4.17	17.02	0.12	2.33	5.80	0.19
M	25.22	3.72	14.33	0.12	2.05	4.84	0.17
S	20.95	2.90	12.09	0.11	1.63	4.07	0.15
TOTAL	22.34	3.14	12.85	0.11	1.76	4.33	0.16

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

In Graph 9, it can be seen that Trucost current environmental rating varies across firm size. The environmental risk of very large firms is 31,11%, followed by large firms with nearly 30%, whereas medium and small firms display environmental risk of 25,22% and 20,95% respectively.

GRAPH 9. TRUCOST ENVIRONMENTAL RATING-CURRENT PER SIZE



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Table 11. Average of environmental rating per firm country

COUNTRY	TRUCOST ENVIRONMENTAL RATING - CURRENT	TRUCOST GREENHOUSE EFFECT (%)	TRUCOST WATER (%)	TRUCOST WASTE (%)	TRUCOST AIR POLLUTANTS (%)	TRUCOST LAND AND WATER POLLUTANTS (%)	TRUCOST NATURAL RESOURCES USED (%)
Ukraine (UA)	35.43	4.26	20.09	0.12	2.7	8.04	0.22
Liechtenstein (LI)	31.9	5.42	19.35	0.15	2.88	3.92	0.19
Greece (GR)	31.44	4.04	19.13	0.15	2.49	5.45	0.18
Bosnia-Herzeg. (BA)	31.36	4.32	17.52	0.13	2.56	6.62	0.22
Moldova (MD)	31.08	3.67	17.87	0.12	2.29	6.92	0.2
Turkey (TR)	28.18	3.55	16.07	0.11	2.07	6.2	0.19
Poland (PL)	27.32	4.05	15.19	0.13	2.34	5.42	0.19
Montenegro (ME)	27.25	4.46	15.3	0.13	2.34	4.84	0.18
Slovakia (SK)	27.02	3.54	15.74	0.11	2.09	5.35	0.19
Lithuania (LT)	26.73	3.87	14.98	0.13	2.33	5.25	0.19
Russia (RU)	25.8	3.8	14.28	0.12	2.2	5.23	0.18
Malta (MT)	25.43	3.77	14.85	0.12	2.06	4.46	0.17
Switzerland (CH)	24.83	3.56	14.51	0.11	1.87	4.6	0.17
Czechia (CZ)	24.78	3.62	13.97	0.12	2.05	4.85	0.18
Austria (AT)	24.04	3.58	13.89	0.11	1.88	4.42	0.16
Spain (ES)	23.98	3.46	14.06	0.12	1.87	4.33	0.15
France (FR)	23.62	3.51	13.61	0.11	1.85	4.37	0.17
Serbia (RS)	23.55	3.22	13.53	0.12	1.85	4.67	0.17
Germany (DE)	23.39	3.71	13.45	0.11	1.93	4.04	0.16
Croatia (HR)	23.2	3.26	13.11	0.12	1.94	4.62	0.16
Finland (FI)	23.18	3.2	13.89	0.11	1.74	4.09	0.16
Ireland (IE)	23.08	3.7	12.96	0.11	1.92	4.23	0.16
Slovenia (SI)	22.92	3.34	12.83	0.12	1.92	4.54	0.16
Hungary (HU)	22.86	3.25	12.87	0.12	1.93	4.53	0.17
Netherlands (NL)	22.57	3.08	13.4	0.11	1.67	4.15	0.16
Letonia (LV)	21.97	3.36	12.41	0.12	1.94	3.99	0.16
Albania (AL)	21.66	2.77	12.23	0.1	1.68	4.73	0.15
Romania (RO)	21.57	2.88	12.29	0.11	1.69	4.44	0.16
Belgium (BE)	20.93	2.81	12.5	0.11	1.56	3.81	0.14
Portugal (PT)	20.83	2.82	12.32	0.11	1.55	3.88	0.15
United Kingdom (GB)	20.77	3.18	12.34	0.1	1.59	3.41	0.15
Estonia (EE)	20.71	3.07	11.92	0.11	1.77	3.69	0.15
Sweden (SE)	20.57	3.1	12.11	0.1	1.67	3.45	0.14
Kosovo (KV)	20.55	2.91	11.64	0.11	1.68	4.06	0.16
Cyprus (CY)	20.29	3.06	11.43	0.11	1.69	3.85	0.15
Denmark (DK)	19.98	2.73	12.15	0.11	1.49	3.37	0.14
Macedonia (MK)	19.08	2.56	10.98	0.1	1.47	3.82	0.15
Italy (IT)	19	2.49	11.24	0.11	1.37	3.67	0.14
Norway (NO)	18.78	2.91	10.81	0.1	1.58	3.24	0.14
Iceland (IS)	18.72	2.9	10.68	0.1	1.56	3.32	0.14
Bulgaria (BG)	16.3	2.32	9.14	0.1	1.32	3.29	0.14
Luxembourg (LU)	15.65	2.63	8.74	0.09	1.33	2.74	0.12
Total	22.34	3.14	12.85	0.11	1.76	4.33	0.16

Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Table 12. Average of environmental rating per firm NAICS

COUNTRY	TRUCOST ENVIRONMENTAL RATING - CURRENT	TRUCOST GREENHOUSE EFFECT (%)	TRUCOST WATER (%)	TRUCOST WASTE (%)	TRUCOST AIR POLLUTANTS (%)	TRUCOST LAND AND WATER POLLUTANTS (%)	TRUCOST NATURAL RESOURCES USED (%)
3111	60.96	5.27	35.34	0.11	3.39	16.47	0.38
3112	69.78	5.64	41.34	0.18	3.68	18.58	0.36
3113	20.73	2.84	14.49	0.14	1.69	1.44	0.12
3114	28.42	3.37	19.06	0.15	1.98	3.69	0.17
3115	19.79	4.70	9.57	0.12	2.29	2.96	0.15
3116	30.45	7.22	14.58	0.15	3.56	4.75	0.20
3117	9.15	2.13	4.35	0.09	1.09	1.38	0.11
3118	13.21	1.69	7.54	0.09	1.01	2.77	0.12
3119	20.64	3.03	13.02	0.10	1.60	2.74	0.14
Total	22.34	3.14	12.85	0.11	1.76	4.33	0.16

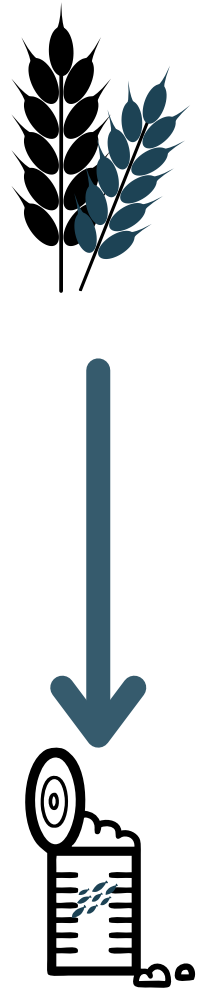
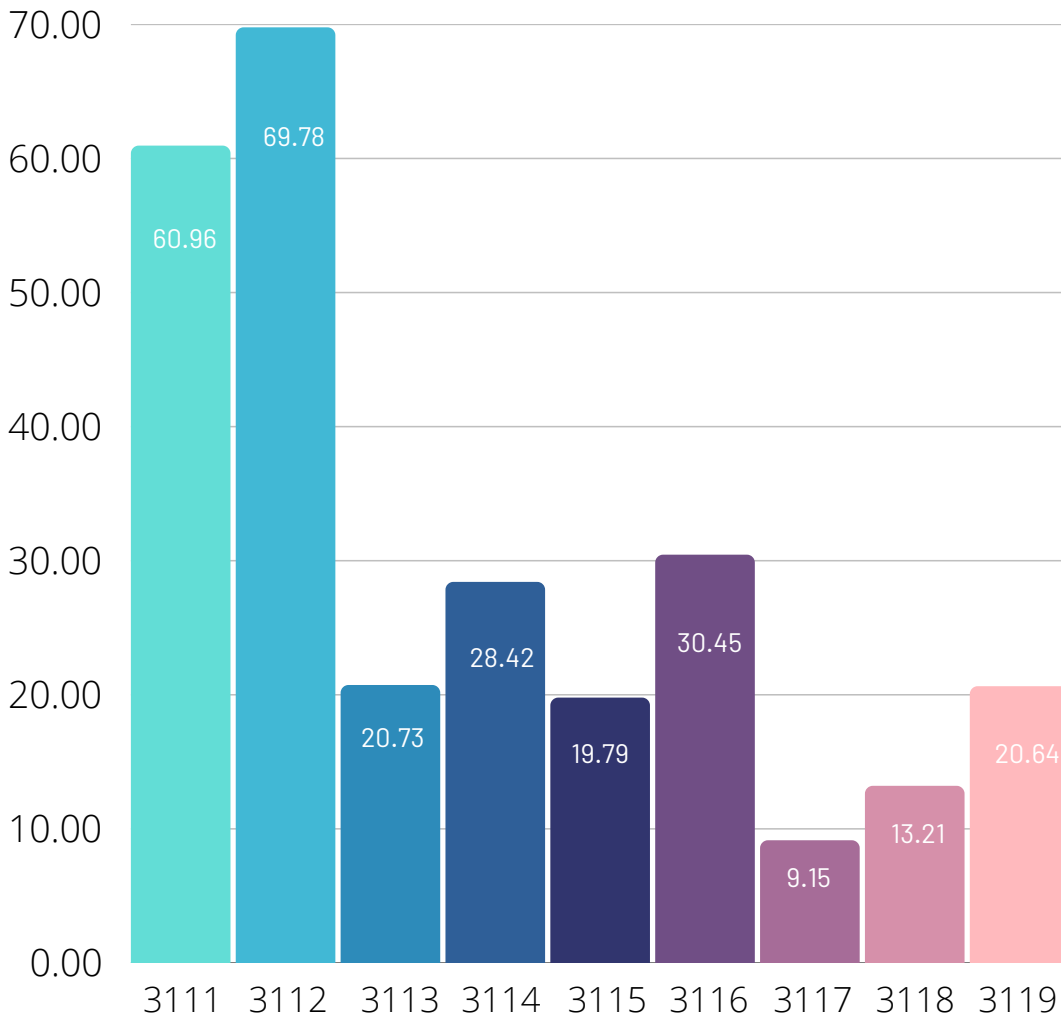
Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

As Table 11 reports, in Europe, average environmental risk of food manufacturing firms sits between 15.65 and 35.43%. The Luxembourg’s firms have the lowest environmental risk alongside Bulgaria, Iceland, Norway and Italy. The Liechtenstein, Ukraine, Greece, Moldova, Bosnia and Herzegovina’s firms all had average environmental risk of over 30%.

Table 12 reports that the average environmental risk of food manufacturing firms per subsector was 22.34%. When we look at the details of Trucost’s different subcategories, environmental costs of water usage stand out for subsectors with 12.85%, whereas costs associated to waste remain low, reaching around 0.1%.



GRAPH 10. AVERAGE OF TRUCOST ENVIRONMENTAL RATING - CURRENT PER SUBSECTOR



Source: Own elaboration based on data extracted from Orbis-Bureau van Dijk

Graph 10 represents the environmental risk difference among food manufacturing subsectors. It can be seen that average environmental risk hovers between 9.15 and 69.78 %.

According to these results, Grain and Oilseed Milling is one of the top three subsectors facing high environmental risks (69.78%), followed by Animal Food Manufacturing (60.96%) and Animal Slaughtering and Packaging (30.45%). By contrast, Seafood Product Preparation & Packaging has the lowest level of environmental risk(9.15%).





1.3. Environmental Score of European food manufacturing firms

In this subsection, we examine environmental sustainability of European food manufacturing firms with data retrieved from Thomson Reuters Eikon. This database provides information on three main categories of environmental scores: resource use, emissions, and environmental innovation. The value of these scores ranges between 0 and 100, where higher values mean greater levels of environmental performance.

Table 13 presents resource use scores by firms' country of origin. The resource use score reflects a firm's performance and its capacity to reduce the use of materials, energy, or water; find more eco-efficient solutions by improving supply chain management; and increase the sustainability of its packaging (Bassetti, Blasi, & Sedita, 2020). From the collected data it appears that in the period between 2011 and 2019, the resource use performance of European food manufacturing firms slightly improved, reaching 58.81 in 2019. In this year, the French firms of this sector rank on the first place with highest resource use score of 84.12, in comparison with the Greek firms which finds themselves behind European average (16.52).

“BETWEEN 2011 AND 2019, THE RESOURCE USE PERFORMANCE OF EUROPEAN FOOD MANUFACTURING FIRMS SLIGHTLY IMPROVED, REACHING 58.81 IN 2019.”

Table 13. Resource Use score by firms' country of origin

COUNTRY	N° FIRMS	MEAN OF RESOURCE USE SCORE 2019	SD OF RESOURCE USE SCORE 2019	N° FIRMS	MEAN OF RESOURCE USE SCORE 2015	SD OF RESOURCE USE SCORE 2015	N° FIRMS	MEAN OF RESOURCE USE SCORE 2011	SD OF RESOURCE USE SCORE 2011
Austria (AT)	1	47.85	-						
Belgium (BE)	1	44.42	-						
France (FR)	2	84.12	7.58	1	92.16	-	1	97.42	-
Germany (DE)	1	46.57	-	1	28.73	-	1	15.46	-
Greece (GR)	1	16.52	-	1	0.00	-	1	0.00	-
Ireland (IE)	3	54.51	7.31	3	45.40	17.54	2	33.25	33.17
Italy (IT)	1	67.60	-						
Norway (NO)	5	60.39	20.74	2	76.87	26.91	2	68.56	27.70
Spain (ES)	1	56.01	-	1	45.90	-	1	44.85	-
Sweden (SE)	3	38.98	15.05						
Switzerland (CH)	5	79.79	13.58	4	55.97	29.96	4	46.26	34.08
United Kingdom (GB)	8	56.69	27.31	5	66.54	19.68	5	59.44	27.30
Total	32	58.81	22.30	18	56.30	27.26	17	49.62	31.67

Source: Own elaboration based on data extracted from Thomson Reuters Eikon

In regards with emissions scores, results are shown in Table 14. The emissions score measures a firm's commitment to and effectiveness in reducing environmental emissions in its production and operational processes (Bassetti et al., 2020), including environmental management certifications, and environmental investment initiatives (Ellimäki et al., 2019). The period between 2011 and 2019 reflects an incapacity of firms to reduce environmental emissions. In 2019, the low performance in reducing environmental emissions were observed for Belgium firms (12.11), in comparison with French ones with 88.33 emissions scores.

Table 14. Emissions score by firms' country of origin

COUNTRY	N° FIRMS	MEAN OF EMISSIONS SCORE 2019	SD OF EMISSIONS SCORE 2019	N° FIRMS	MEAN OF EMISSIONS SCORE 2015	SD OF EMISSIONS SCORE 2015	N° FIRMS	MEAN OF EMISSIONS SCORE 2011	SD OF EMISSIONS SCORE 2011
Austria (AT)	1	24.45	-						
Belgium (BE)	1	12.11	-						
France (FR)	2	88.33	8.72	1	93.41	-	1	95.36	-
Germany (DE)	1	60.13	-	1	32.95	-	1	20.10	-
Greece (GR)	1	40.31	-						
Ireland (IE)	3	32.38	16.42	3	30.62	4.32	2	27.84	9.48
Italy (IT)	1	75.11	-						
Norway (NO)	5	62.77	29.22	2	79.85	12.61	2	59.28	21.87
Spain (ES)	1	80.84	-	1	67.05	-	1	76.80	-
Sweden (SE)	3	39.94	35.54						
Switzerland (CH)	5	44.76	22.40	4	36.24	16.35	4	24.36	18.52
United Kingdom (GB)	8	51.55	23.83	5	61.52	26.38	5	60.40	19.57
Total	32	51.15	26.34	17	52.80	25.55	16	47.87	27.14

Source: Own elaboration based on data extracted from Thomson Reuters Eikon

Table 15. Environmental innovation score by firms' country of origin

COUNTRY	N° FIRMS	MEAN OF ENV. INNOV SCORE 2019	SD OF ENV. INNOV SCORE 2019	N° FIRMS	MEAN OF ENV. INNOV SCORE 2015	SD OF ENV. INNOV SCORE 2015	N° FIRMS	MEAN OF ENV. INNOV SCORE 2011	SD OF ENV. INNOV SCORE 2011
Austria (AT)	1	26.89	-						
Belgium (BE)	1	0.00	-						
France (FR)	2	57.39	43.13	1	92.06	-	1	26.89	-
Germany (DE)	1	26.89	-	1	26.98	-	1	0.00	-
Greece (GR)	1	0.00	-	1	0.00	-	1	57.39	-
Ireland (IE)	3	38.26	45.03	3	8.99	15.58	2	26.89	16.46
Italy (IT)	1	26.89	-					0.00	
Norway (NO)	5	28.33	35.90	2	51.19	34.24	2	38.26	33.52
Spain (ES)	1	26.89	-	1	26.98	-	1	26.89	-
Sweden (SE)	3	31.44	33.94					28.33	
Switzerland (CH)	5	26.89	0.00	4	20.24	13.49	4	26.89	29.69
United Kingdom (GB)	8	20.95	29.81	5	28.93	37.07	5	31.44	45.58
Total	32	27.35	27.61	18	27.83	29.70	17	26.89	34.31

Source: Own elaboration based on data extracted from Thomson Reuters Eikon

The environmental innovation scores by firms' country of origin are shown in Table 20. The environmental innovation score reflects a firm's capacity to create new market opportunities through new green technologies and processes or the development of eco-efficient products or services (Duque-Grisales & Aguilera-Caracuel, 2019).

The collected data suggests that environmental innovation can be considered a weak point of environmental performance of food manufacturers in Europe. The average environmental innovation scores range between 27.35 and 34.41 in the period of 2011-2019. For analyzed period, French firms can be considered as eco-innovative leaders, with scores varying between 57.39 and 93.10.



Internationalization of European food manufacturing firms

In this section, we will provide some insight into internationalization patterns of European food manufacturing firms. Internationalization refers to the degree to which a firm's sale revenues or operations are conducted outside of its home country (Elango & Pattnaik, 2007; Hitt, Tihanyi, Miller, & Connelly, 2006). In the case of food manufacturers, firms show a trend towards internationalization and globalize their sales. Food manufacturers enter foreign using export entry mode (Azar, 2010). In 2019, according World Bank, on euro area, nearly 9.6 % of total merchandise exports were products of the food industry. The information was obtained from the variable.

Following previous studies (eg. Gómez-Bolaños et al., 2019). For information on the firm's level of internationalization we have used the variable "countries of risk revenue fraction by country" from Thomson Reuters Eikon database. The sum of fractional exposures allocated to the company's countries of risk based on the StarMine Countries of Risk Model. The StarMine Countries of Risk Model uses four sources of data, which are, in order of importance: revenue distribution by geography, the location of a company's headquarters, the country where its primary equity security listing trades, and financial reporting currency. The model provides estimates on the countries to which a company is exposed, and estimates a fractional contribution to each. The fraction is a value between 0 and 1, where a higher value indicates the company has higher exposure to the country. This field supports the selection of countries and the default is to include all countries.

Our analysis shows that for the listed sample, sales of firms from Bulgaria, Iceland, Macedonia, Montenegro, Slovakia and Romania are destined to their home market. For the less internationalized firms, we can highlight Portuguese, Serbian, Russian, Slovenian and Ukrainian ones. The firms with the highest percentage of sales in international markets are from Croatia, Ireland, Holland, Norway and Switzerland.



Table 16. Sample description per firms' country of origin and home-country revenue (%)

COUNTRY	Nº FIRMS	MEAN OF HOME REVENUE %
Austria (AT)	2	0.819
Belgium (BE)	5	0.554
Bulgaria (BG)	6	1.000
Croatia (HR)	3	0.301
Denmark (DK)	1	0.539
Estonia (EE)	1	0.483
Finland (FI)	4	0.777
France (FR)	14	0.765
Germany (DE)	6	0.813
Greece (GR)	12	0.862
Iceland (IS)	1	1.000
Ireland (IE)	3	0.209
Italy (IT)	7	0.772
Jersey (JE)	1	0.600
Lithuania (LT)	4	0.657
Luxembourg (LU)	2	0.450
Macedonia (MK)	13	1.000
Netherlands (NL)	1	0.382
Norway (NO)	5	0.168
Poland (PL)	10	0.807
Portugal (PT)	1	0.902
Montenegro (ME)	6	1.000
Serbia (RS)	31	0.984
Romania (RO)	11	1.000
Russia (RU)	15	0.967
Slovakia (SK)	4	1.000
Slovenia (SI)	8	0.988
Spain (ES)	4	0.638
Sweden (SE)	10	0.864
Switzerland (CH)	5	0.384
Ukraine (UA)	11	0.964
United Kingdom (GB)	14	0.539
Total	221	0.819

“THE FIRMS WITH THE HIGHEST PERCENTAGE OF SALES IN INTERNATIONAL MARKETS ARE FROM CROATIA, IRELAND, HOLLAND, NORWAY AND SWITZERLAND.”

Source: Own elaboration based on data extracted from Thomson Reuters Eikon

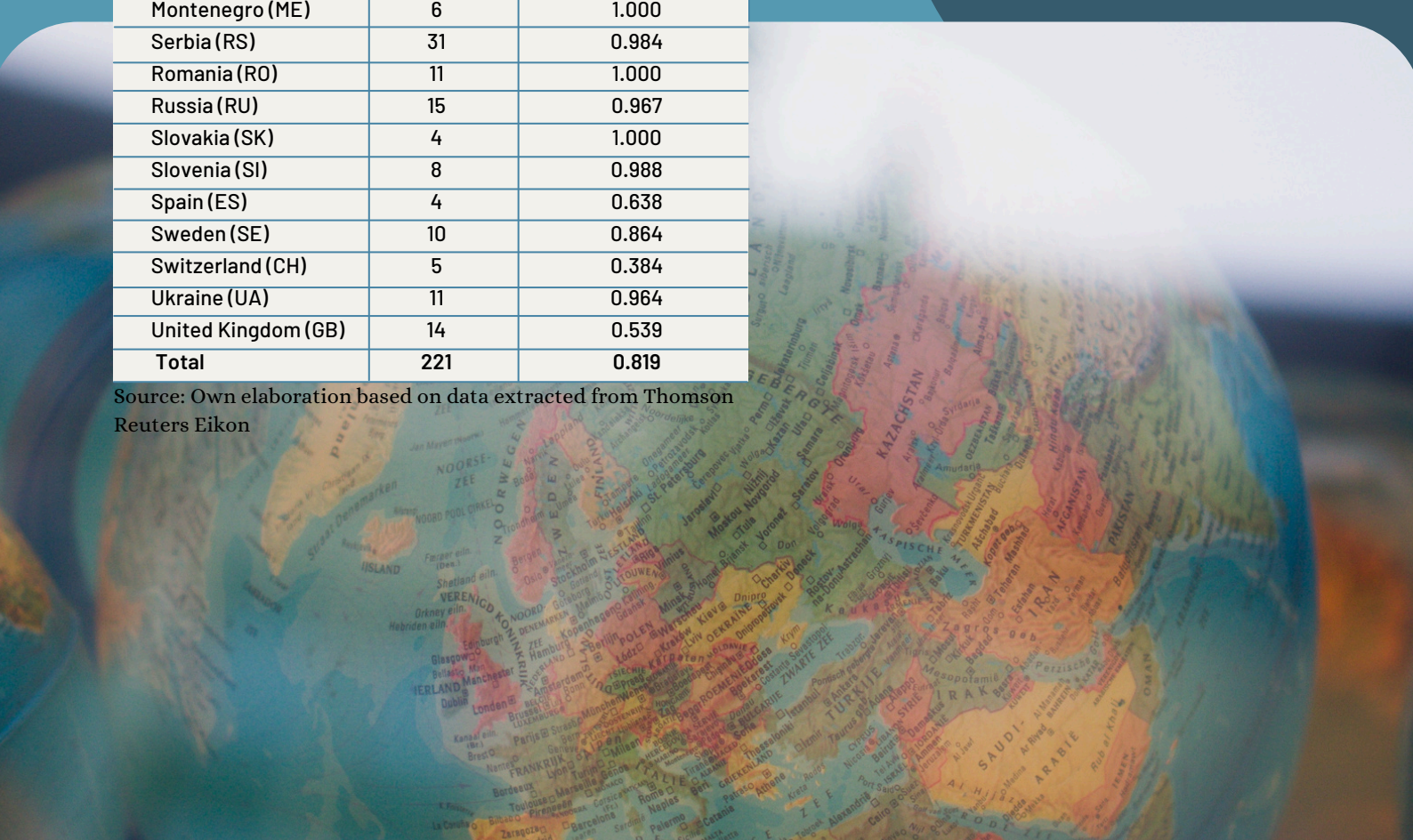


Table 17. Sample description by firms' country of origin and internationalization: develop / developing / frontier countries, %

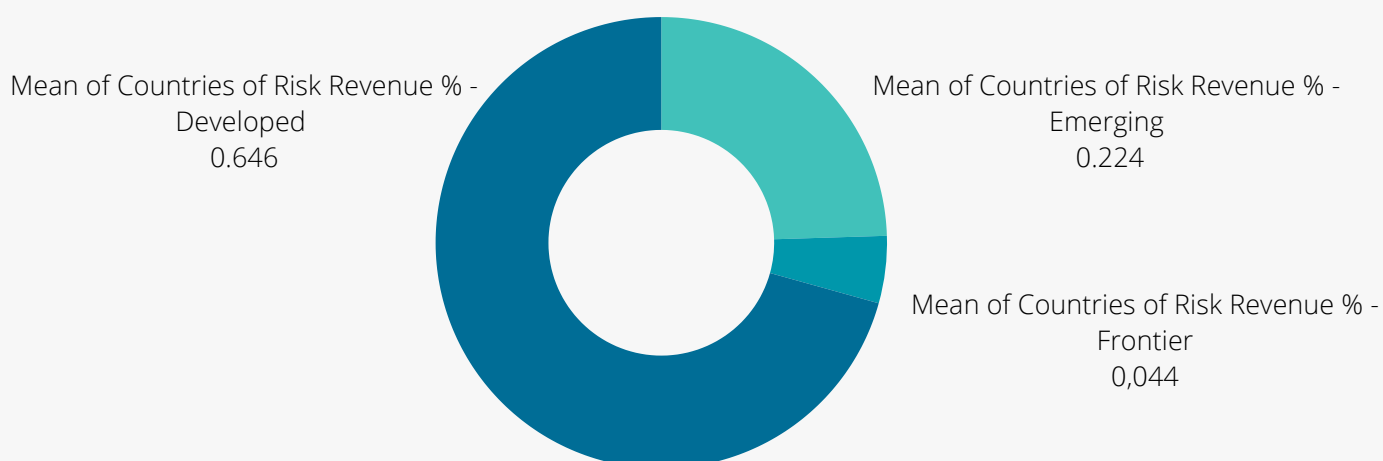
COUNTRY	Nº FIRMS	MEAN OF COUNTRIES OF RISK REVENUE % - DEVELOPED	RISK REVENUE % - EMERGING	RISK REVENUE % - FRONTIER
Austria (AT)	2	0.807	0.108	0.023
Belgium (BE)	5	0.857	0.086	0.003
Croatia (HR)	5	0.387	0.103	0.384
Denmark (DK)	1	0.604	0.289	0.000
Estonia (EE)	1	0.885	0.028	0.067
Finland (FI)	4	0.894	0.068	0.002
France (FR)	9	0.744	0.120	0.006
Germany (DE)	4	0.743	0.158	0.000
Greece (GR)	2	0.223	0.755	0.003
Ireland (IE)	3	0.739	0.163	0.002
Italy (IT)	5	0.883	0.062	0.002
Lithuania (LT)	4	0.419	0.082	0.416
Luxembourg (LU)	2	0.147	0.495	0.103
Netherlands (NL)	2	0.469	0.333	0.000
Norway (NO)	5	0.732	0.140	0.007
Poland (PL)	11	0.111	0.858	0.002
Serbia (RS)	1	0.612	0.097	0.083
Russia (RU)	1	0.482	0.340	0.000
Spain (ES)	3	0.802	0.125	0.000
Sweden (SE)	3	0.717	0.141	0.000
Switzerland (CH)	7	0.816	0.095	0.003
United Kingdom (GB)	15	0.840	0.101	0.001
Total	95	0.646	0.224	0.044

Source: Own elaboration based on data extracted from Thomson Reuters Eikon

Table 17 illustrates the international sales of European food manufacturers to developed, emerging and frontier countries. It can be noted that international sales of these firms are mainly destined to developed countries (0.646%). As an exception, Polish (0.858), Greek (0.755), and Luxembourger (0.495) firms opt for internationalization towards emerging markets.

“THE EUROPEAN FOOD MANUFACTURERS’ OVERSEAS SALES DISTRIBUTED ACROSS DIFFERENT MARKETS, WITH DEVELOPED COUNTRIES RANKED AS PREFERRED DESTINATION (0.646), FOLLOWED BY EMERGING (0.224) AND FRONTIER COUNTRIES (0.044).”

GRAPH 11 INTERNATIONALIZATION OF EUROPEAN FOOD MANUFACTURING FIRMS



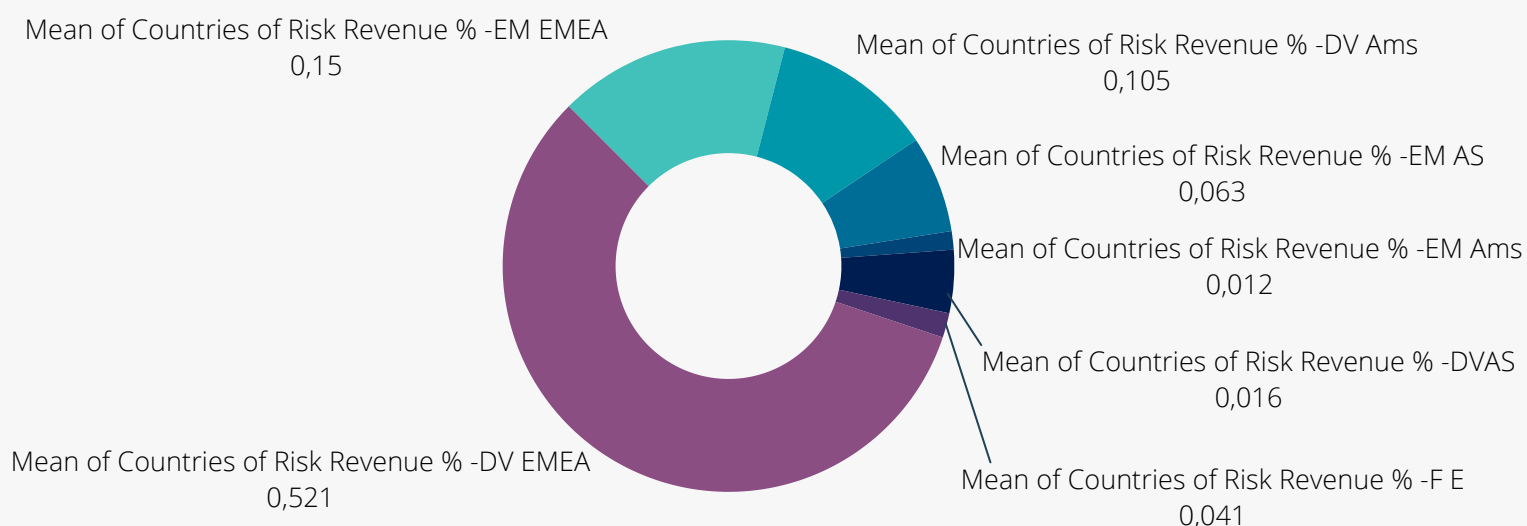
Source: Own elaboration based on data extracted from Thomson Reuters Eikon

Graph 11 displays the European food manufacturers' overseas sales distributed across different markets, with developed countries ranked as preferred destination (0.646), followed by emerging (0.224) and frontier countries (0.044).

Table 18 presents European food manufacturing firms' internationalization, broken down by different regions. At first glance it is clear that firms internationalize towards developed EMEA market. However, interestingly, Irish, Lithuanian, and Polish food manufacturers enter into foreign markets, such as Developed Americas, Frontier Europe, and Emerging EMEA respectively.

In Graph 12, it can be observed that developed emerging EMEA represents the largest portion of international sales of European food manufacturers (0.521), whereas emerging Americas undoubtedly the smallest (0.012).

GRAPH 12 INTERNATIONALIZATION OF EUROPEAN FOOD MANUFACTURING PER REGION



Source: Own elaboration based on data extracted from Thomson Reuters Eikon

Table 18. Sample description by firms' country of origin and internationalization: Developed Americas (DV AMs) / Developed Europe and Middle East (DV EMEA) / Developed Asia (DV AS) / Frontier Europe (F E) / Frontier Americas (F AMs) / Frontier Asia (F AS) / Emerging Americas (EM AMs) / Emerging Asia (EM AS) / Emerging EMEA (EM EMEA), %.

COUNTRY	Nº FIRMS	MEAN OF COUNTRIES OF RISK REVENUE %								
		DV AMS	DV EMEA	DV AS	F E	F AMS	F AS	EM AMS	EM AS	EM EMEA
Austria (AT)	2	0.064	0.726	0.013	0.023	0.000	0.000	0.008	0.055	0.045
Belgium (BE)	5	0.051	0.796	0.008	0.003	0.000	0.000	0.003	0.038	0.045
Croatia (HR)	5	0.168	0.2	0.015	0.384	0.000	0.000	0.009	0.059	0.034
Denmark (DK)	1	0.144	0.42	0.032	0.000	0.000	0.000	0.154	0.125	0.011
Estonia (EE)	1	0.026	0.852	0.006	0.067	0.000	0.000	0.003	0.023	0.002
Finland (FI)	4	0.048	0.832	0.011	0.002	0.000	0.000	0.006	0.041	0.02
France (FR)	9	0.131	0.589	0.021	0.000	0.000	0.000	0.007	0.075	0.039
Germany (DE)	4	0.136	0.569	0.03	0.000	0.000	0.000	0.018	0.117	0.022
Greece (GR)	2	0.003	0.22	0.000	0.003	0.000	0.000	0.000	0.002	0.753
Ireland (IE)	3	0.239	0.466	0.026	0.000	0.002	0.000	0.032	0.104	0.027
Italy (IT)	5	0.109	0.757	0.007	0.002	0.000	0.000	0.002	0.029	0.032
Lithuania (LT)	4	0.022	0.386	0.005	0.416	0.000	0.000	0.002	0.027	0.053
Luxembourg (LU)	2	0.000	0.04	0.106	0.000	0.000	0.013	0.000	0.384	0.11
Netherlands (NL)	2	0.000	0.469	0.000	0.000	0.000	0.000	0.000	0.000	0.333
Norway (NO)	5	0.089	0.622	0.021	0.007	0.000	0.000	0.006	0.08	0.055
Poland (PL)	11	0.031	0.071	0.007	0.002	0.000	0.000	0.004	0.026	0.828
Serbia (RS)	1	0.027	0.585	0.000	0.083	0.000	0.000	0.000	0.018	0.079
Russia (RU)	1	0.253	0.158	0.056	0.000	0.000	0.000	0.034	0.219	0.087
Spain (ES)	3	0.167	0.62	0.012	0.000	0.000	0.000	0.018	0.044	0.063
Sweden (SE)	3	0.192	0.502	0.023	0.000	0.000	0.000	0.025	0.082	0.035
Switzerland (CH)	7	0.166	0.643	0.007	0.002	0.000	0.000	0.026	0.026	0.043
United Kingdom (GB)	15	0.133	0.68	0.02	0.000	0.001	0.000	0.012	0.074	0.015
Total	95	0.105	0.521	0.016	0.041	0.000	0.000	0.012	0.063	0.150

Source: Own elaboration based on data extracted from Thomson Reuters Eikon



Conclusion

In this section, we highlight key findings of our analysis on European food manufacturing industry. This report presents the comprehensive picture of the structure, environmental impact, and internationalization pattern of Europe's food manufacturing industry.

In general, the food manufacturing industry has proven to be relatively stable during economic downturns. The data reveal that profitability of these firms increased between 2011 and 2019.

With regards to distinctive traits of these firms, we can highlight the size, geographical scope and specialization. We have found that small firms are the engine of the European food manufacturing industry. Importantly, our report notes that this sector is highly concentrated on a few countries. Italy alone accounts for 17% of food manufacturers, followed by Russian firms that represents an 11%. We also have identified that European firms of this sector incline to specialize in the baking and tortilla manufacturing.

Moreover, the sustainability of the environment in Food Manufacturing industry is an important topic and has been largely addressed in the previous literature. The importance of reducing negative environmental impact of food manufacturing industry increasingly recognized (Christopher, Trott, Hende, & Hultink, 2020; Williams & Wikstrom, 2011).



In this report, we provide an overall assessment regarding environmental impacts of this sector across firm size, sub-sectors, and countries. The collected data show that a very large firms reflect higher environmental risk than small ones in this sector. Concerning the environmental impact of sub-sectors, data seem to suggest that Grain & Oilseed Milling firms face the highest environmental risks, specifically in greenhouse effect, use of water, air, land and water pollutants. However, Seafood Product Preparation & Packaging is associated with lowest level of environmental risk. Interestingly, high environmental costs of water usage stand out for all subsectors. The descriptive analysis ranked Liechtenstein, Ukraine, Greece, Moldova, Bosnia and Herzegovina's firms as having the highest financial exposure to environmental related risks. Nevertheless, firms from Luxembourg, Bulgaria, Iceland, Norway and Italy are the least exposed to environment risks. We also find that the French manufacturing firms ranks above the European average in resource use, emissions and environmental innovation.

Furthermore, this report seeks to provide insights about European food manufacturers in their internationalization patterns. Globally, firms of this sector show a trend towards internationalization and globalize their sales using export entry mode (Azar, 2010).

This report provides interesting evidence on internationalization of this sector, showing a rather diversified set of internationalization patterns. Our analysis shows that for the listed sample, firms from Bulgaria, Iceland, Macedonia, Montenegro, Slovakia and Romania sell only in their local market. Additionally, results show that firms from Portugal, Serbia, Russia, Slovenia and Ukraine are less internationalized, whereas firms with the highest percentage of sales in foreign markets are from Croatia, Ireland, Holland, Norway and Switzerland. We have also found that European food manufacturers mainly internationalize towards developed countries, in particular, towards developed EMEA market.

Finally, as a critical overall assessment, we want to highlight that despite the overall positive environmental sustainability initiatives taken by European food manufacturers, still further room for improvements exists. Several leaders have emphasized the need for more radical, accelerated action, and for firms from food industry to look at what actions are needed rather than what appears achievable (Fi Global, 2019). Most notably, Carlos Moedas, EU Commissioner for research, science and innovation, highlighted that "we cannot meet commitments [on sustainability goals and improving population health] without higher ambitions for research and innovation in our food systems... We need to see transformative, breakthrough changes. Not just incremental changes." (Food 2030 Conference, 2017). Similarly, Dan Crossley, executive director of the Food Ethics Council emphasized that "it's vital that food companies recognize the pivotal role they have in implementing the SDGs. Food businesses also need to acknowledge their immense reach and influence. They may employ thousands of people, but they reach many millions of people through their supply chains and their products. 2030 will be with us sooner than we think. It's time for food businesses to step up and be part of delivering the SDGs!" (Fi Global, 2019, p. 19).

It is important to note that, recently, European commission endorsed the goal of developing a "fair, healthy and environmentally friendly food system" (EU Council, 2020). One of the EU's sustainable transition line is to reduce environmental impact of food manufacturing, processing, retailing, packaging and transportation. In particular, "the Commission will seek commitments from food companies and organizations to take concrete actions on health and sustainability, focusing in particular on: reformulating food products in line with guidelines for healthy, sustainable diets; reducing their environmental footprint and energy consumption by becoming more energy efficient; adapting marketing and advertising strategies taking into account the needs of the most vulnerable; ensuring that food price campaigns do not undermine citizens' perception of the value of food; and reducing packaging" (European Commission, 2020, p.10).

We are aware that our research may have some limitations. The first limitation is related to measurement of the environmental risk and internationalization. These analyses were performed on cross-sectional data due to limitations of Trucost Rating of Orbis-Bureau van Dijk and the variable "countries of risk revenue fraction by country" of Thomson Reuters Eikon. Second, the sample of listed firms was reduced significantly when we analyzed essential environmental indicators that are only available in Thomson Reuters Eikon. Third, for some variables, our analyses present substantial decrease in the number of firms for 2019 since information is not yet available for all firms.

Limitations of this report are acknowledged and conclusions should be considered in the European context. Future research should strive to obtain longitudinal data to examine environmental risks of European food manufacturers. In the same vein, research should also investigate these firms' internationalization behavior over long periods of time.



Annex I. Supplementary material: Other tables

Tabla I. Eikon Thomson Reuters sample description per firms' country of origin and turnover

COUNTRY	Nº FIRMS	MEAN OF TURNOVER 2019	Nº FIRMS	MEAN OF TURNOVER 2015	Nº FIRMS	MEAN OF TURNOVER 2011
Austria (AT)	3	87015.948	3	76648.262	3	76893.922
Belgium (BE)	5	1341491.200	5	1013489.000	5	1129.000
Bosnia-Herzeg. (BA)	20	12690.462	26	10281.411	16	5874.219
Bulgaria (BG)	5	7896.496	6	13155.969	2	1298.624
Croatia (HR)	13	229232.598	13	209548.423	10	282368.105
Cyprus (CY)	2	29985.789	2	35125.815	2	46376.607
Denmark (DK)	1	3141748.673	1	1842591.444	1	1931095.172
Estonia (EE)	1	97651.740	1	55163.337	1	114865.963
Finland (FI)	4	1055245.151	4	1136686.292	4	1520177.754
France (FR)	13	3984161.009	13	3350326.572	12	3736723.903
Germany (DE)	6	1432466.123	6	1369065.692	5	2304567.883
Greece (GR)	10	174767.315	12	141196.670	11	228448.613
Guernsey (GG)			1	13730.000	1	13937.000
Iceland (IS)	1	100474.067	1	82742.598	1	69340.282
Ireland (IE)	2	6244418.087	2	4833406.393	2	5158359.006
Italy (IT)	6	420099.307	5	429855.751	4	232623.469
Jersey (JE)	1	65965.717	1	29872.140	1	78115.157
Lithuania (LT)	4	191756.491	4	162715.460	4	205963.798
Luxembourg (LU)	2	415508.534	2	369988.141	2	586060.959
Macedonia (MK)	13	15433.874	12	7760.063	1	29717.299
Netherlands (NL)	2	1455905.989	2	1328783.313	1	367734.113
Norway (NO)	7	2294420.028	7	1608185.052	6	2849041.562
Poland (PL)	12	132468.592	17	112204.845	10	152930.387
Portugal (PT)	1	40421.050	1	33351.234	1	48345.276
Montenegro (ME)	2	1331.935	2	5084.706	3	3206.118
Serbia (RS)	27	12414.305	27	13363.304	11	3696.361
Romania (RO)	10	17233.349	11	13464.602	2	8731.038
Russia (RU)	14	92916.826	16	58223.633	3	224144.711
Slovakia (SK)	4	10808.511	4	7903.145		
Slovenia (SI)			1	51997.514	1	62758.609
Spain (ES)	3	1097883.740	3	960987.447	2	2281071.760
Sweden (SE)	10	119110.749	9	100330.179	6	67317.401
Switzerland (CH)	8	3108121.866	8	2706065.785	8	2649517.767
Ukraine (UA)	9	231669.479	10	131984.140	2	709254.566
United Kingdom (GB)	16	1513773.407	15	675126.054	13	2151238.776
Total	237	738335.330	253	537719.698	157	1039683.861

Source: Eikon Thomson Reuters

Tabla II. Eikon Thomson Reuters sample description per firms' country of origin and number of employees

COUNTRY	Nº FIRMS	MEAN OF TURNOVER 2019	Nº FIRMS	MEAN OF TURNOVER 2015	Nº FIRMS	MEAN OF TURNOVER 2011
Austria (AT)	2	5075.5	2	4248.5	2	4335.5
Belgium (BE)	6	2869.8	5	2626.0	5	1264.6
Bosnia-Herzeg. (BA)	20	153.8	19	173.4	14	126.1
Bulgaria (BG)	2	41.5	3	264.0	1	4.0
Croatia (HR)	13	1874.0	11	1979.5	5	3095.6
Cyprus (CY)	1	237.0	2	261.5	1	1606.0
Denmark (DK)	1	9683.0	1	2382.0	1	2688.0
Estonia (EE)	1	379.0	1	228.0	1	695.0
Finland (FI)	4	3018.5	4	3555.0	4	3945.5
France (FR)	13	14389.4	12	14283.0	11	15518.6
Germany (DE)	6	3694.0	5	3839.4	4	4830.0
Greece (GR)	9	539.0	10	266.0	11	283.3
Guernsey (GG)			1	862.0	1	350.0
Iceland (IS)	1	494.0	1	424.0	1	414.0
Ireland (IE)	2	15316.0	2	13926.5	2	13802.5
Italy (IT)	5	1027.2	4	1037.8	3	191.0
Jersey (JE)	1	844.0	1	1132.0	1	1751.0
Lithuania (LT)	4	1342.5	4	1405.0	3	1460.3
Luxembourg (LU)	2	22741.5	2	21879.0	2	17876.5
Macedonia (MK)	10	238.0	7	156.9	3	57.3
Netherlands (NL)	2	2222.0	1	2370.0		
Norway (NO)	6	7616.2	6	5788.5	5	9001.8
Poland (PL)	11	573.7	15	572.8	8	641.9
Portugal (PT)			1	109.0		
Montenegro (ME)	2	9.5	2	27.5	3	48.7
Serbia (RS)	24	113.7	24	121.5	11	95.6
Romania (RO)	11	171.3	9	202.9	2	91.5
Russia (RU)	8	803.0	3	1114.0	1	7.0
Slovakia (SK)	3	109.7	3	118.3		
Slovenia (SI)			1	448.0	1	507.0
Spain (ES)	2	4058.5	2	2986.5	2	7550.0
Sweden (SE)	8	513.8	9	339.1	6	138.2
Switzerland (CH)	8	8380.4	8	7128.1	8	4818.1
Ukraine (UA)	10	3247.2	10	3281.8	1	1696.0
United Kingdom	15	7202.5	14	2221.1	13	8556.6
Total	213	3142.2	205	2574.1	137	3916.8

Source: Eikon Thomson Reuters

Tabla III. Top 100 large firms

FIRM	COUNTRY	NAICS	EMPLOYEE NUMBER	2019			2015		
				TURNOVER	ROE	EMPLOYEE NUMBER	TURNOVER	ROE	
WITTINGTON INVESTMENTS LIMITED	GB	3119	139,570	19,589,529	11.35	125,166	20,005,694	9.48	
ASSOCIATED BRITISH FOODS PLC	GB	3119	138,097	19,292,386	12.28	124,036	19,736,387	10.86	
MHP SE	CY	3116	31,427	2,061,324	15.5	30,900	1,281,631	-24.69	
BOPARAN HOLDCO LIMITED	GB	3116	20,746	3,333,942	-	22,974	4,885,251	-	
SAVENCIA SA	FR	3115	20,031	6,162,732	8.24	18,911	5,335,324	7.97	
SUEDZUCKER AG	DE	3113	19,188	7,409,692	0.24	16,486	7,048,347	5.07	
JACOBS DOUWE EGBERTS B.V.	NL	3119	16,973	6,821,284	8.73	9,110	4,305,325	-2.75	
PERFETTI VAN MELLE GROUP B.V.	NL	3113	14,654	2,993,972	34.86	13,488	2,853,244	20.01	
UNIBEL	FR	3115	12,438	3,825,802	9.46	10,861	3,210,909	17.9	
BEL	FR	3115	12,438	3,825,348	10.09	10,861	3,211,135	17.61	
BARRY CALLEBAUT AG	CH	3113	12,257	7,424,480	18.76	9,430	6,507,256	15.9	
LIMITED LIABILITY COMPANY UNILEVER RUS	RU	3119	12,221	1,268,991	81.87	12,203	979,712	131.2	
NUTRECO N.V.	NL	3116	12,004	7,232,448	19.67	11,006	6,182,836	23.5	
BELL FOOD GROUP AG	CH	3116	11,960	4,144,805	6.15	8,148	2,802,871	13.18	
MOY PARK LIMITED	GB	3116	10,126	2,073,780	23.04	9,230	2,091,116	16.3	
AGRANA BETEILIGUNGS-AKTIENGESELLSCHAFT	AT	3113	9,389	2,753,853	5.04	7,805	2,728,596	8.7	
ULKER BISKUVI SANAYI A.S.	TR	3118	8,921	1,315,283	25.31	9,488	1,326,179	22.48	
ROQUETTE FRERES	FR	3112	8,328	4,146,251	-	7,970	3,647,069	-	
JACOBS DOUEWE EGBERTS RUS LLC	RU	3119	8,129	471,584	88.47	8,111	255,958	24.46	
EMMI AG	CH	3115	7,826	3,612,697	11.77	5,405	3,244,540	12.04	
GREENCORE FOOD TO GO LIMITED	GB	3119	7,792	1,181,058	24.45	5,278	944,998	38.01	
HKSCAN OYJ	FI	3116	6,928	1,968,197	-10.58	7,437	2,098,687	0.52	
AGRICOLA TRE VALLI - SOCIETA' COOPERATIVA	IT	3116	6,710	2,516,393	0.65	6,760	3,380,355	20.52	
ABF GRAIN PRODUCTS LIMITED	GB	3118	6,053	1,244,317	-8.47	5,575	1,237,903	0.58	
2 SISTERS FOOD GROUP LIMITED	GB	3116	5,983	1,459,354	-	5,031	1,469,797	-	
PILGRIM'S PRIDE LTD.	GB	3116	5,884	1,316,884	-67.42	6,142	1,762,513	4.78	
ATLANTIC GRUPA D.D.	HR	3119	5,557	828,282	17.36	5,387	779,621	14.86	
SONAC VERSMOLD GMBH	DE	3116	5,200	-	-	-	-	-	
EL POZO ALIMENTACION SA	ES	3116	4,897	1,446,168	12.56	3,994	1,058,001	14.52	
NESTLE UK LTD.	GB	3119	4,659	2,198,261	9.64	5,043	2,340,046	9.07	
BANVIT BANDIRMA VITAMINLI YEM SANAYII A.S.	TR	3116	4,556	582,382	12.88	4,592	693,078	-57.03	
FERRERO INDUSTRIALE ITALIA S.R.L.	IT	3113	4,519	737,964	9.15	-	-	-	
WARBURTONS LIMITED	GB	3118	4,504	619,694	4.26	4,588	838,175	10.53	
K & U BAECKEREI GMBH	DE	3118	4,500	-	-	4,200	292,811	-	
LIMITED LIABILITY COMPANY LEBEDYANSKY	RU	3119	4,444	29,106	6.31	4,454	132,108	-2.66	
LEROY SEAFOOD GROUP ASA	NO	3117	4,361	2,326,526	13.32	2,527	1,526,756	17.13	
LIMITED LIABILITY COMPANY MAREVEN FOOD CENTRAL	RU	3118	4,259	244,864	41.14	4,259	234,278	879.13	
UNITED BISCUITS (UK) LIMITED	GB	3118	4,240	1,093,546	3.72	4,734	1,338,748	7.92	
MARS LIMITED LIABILITY COMPANY	RU	3113	4,231	2,249,201	41.15	4,211	1,289,071	21.62	
BARILLA G. E R. FRATELLI - SOCIETA' PER AZIONI	IT	3118	4,127	3,042,078	8.76	3,993	2,725,947	11.34	
JSC OSTANKINO MEAT PROCESSING PLANT	RU	3116	4,112	674,590	35.42	3,716	504,433	12.73	
LUIGI LAVAZZA - LAVAZZA S.P.A.	IT	3119	4,022	2,474,390	6.93	2,562	1,633,068	3.61	
INALCA SOCIETA' PER AZIONI	IT	3116	3,914	2,516,266	9.32	3,193	1,622,439	9.04	
NESTLE ESPANA SAU	ES	3119	3,641	2,391,650	56.45	4,271	2,159,645	37.31	
PREMIER FOODS GROUP LIMITED	GB	3119	3,622	1,002,683	-1.96	7,451	1,689,649	53.77	
2 SISTERS POULTRY LIMITED	GB	3116	3,603	553,586	-	4,136	850,773	-	
FACCENDA FOODS LIMITED	GB	3116	3,588	739,913	9.54	-	-	-	
MASSIMO ZANETTI BEVERAGE GROUP S.P.A.	IT	3119	3,585	1,034,164	7.23	3,014	1,031,858	6.45	
OPEN JOINT STOCK COMPANY ROT FRONT	RU	3113	3,584	217,427	7.52	3,365	160,021	6.13	
POM.ITA. S.R.L.	IT	3114	3,422	3,153	70.77	-	0	-30.26	

FIRM	COUNTRY	NAICS	2019			2015		
			EMPLOYEE NUMBER	TURNOVER	ROE	EMPLOYEE NUMBER	TURNOVER	ROE
FERRERO OHG MBH	DE	3113	3,400	-	-	3,400	-	-
FOOD DEVELOPMENT TOV	UA	3115	3,278	227,391	-	-	-	-
ALYANCE (LIMITED LIABILITY COMPANY)	RU	3113	3,255	438,076	12.76	47	42,717	-
SANDORA TOV	UA	3114	3,230	439,503	-	3,195	288,896	-
NESTLE' ITALIANA S.P.A. (NE.IT. S.P.A.)	IT	3113	3,175	1,482,195	24.26	3,947	1,542,832	5.09
OTKRYTOE AKTSIONERNOE OBSHCHESTVO MILKOM	RU	3115	3,132	370,519	61.76	2,498	171,238	166.81
HOMANN FEINKOST GMBH	DE	3119	3,000	-	-	-	582,486	-
LDC SABLE	FR	3116	2,971	813,590	8.35	2,729	763,628	15.46
DUKAT MLIJEČNA INDUSTRIJA D.D	HR	3115	2,971	591,258	9.23	2,711	494,527	6.65
A. ESPERSEN A/S	DK	3117	2,929	426,666	2.45	2,163	310,029	-29.43
UNICARM SRL	RO	3116	2,900	158,481	7.72	2,825	155,524	24.49
AKTSIONERNOE OBSHCHESTVO EFIRNOE	RU	3112	2,872	424,455	-3.81	1,745	309,985	20.92
LIMITED LIABILITY COMPANY FAZER , LLC FAZER	RU	3118	2,860	205,255	4.86	2,876	139,327	-4.29
HOVIS LIMITED	GB	3118	2,796	437,938	13.86	3,296	508,732	-14.8
JOINT STOCK COMPANY HLEBPROM	RU	3118	2,758	183,912	41.1	2,756	137,879	145.6
CONDITOREI COPPENRATH & WIESE KG	DE	3118	2,733	-	-	2,112	400,097	-
MILKILAND N.V.	NL	3115	2,729	141,566	-	-	210,332	-203.32
YUZHMOREYBLOT	RU	3117	2,722	210,387	39.75	99	65,483	117.98
AKTSIONERNOE OBSHCHESTVO AKKOND	RU	3118	2,699	175,822	31.89	1,236	122,381	32.57
CONCERN KHLIBPROM PRIVATE JSC AT	UA	3118	2,678	57,197	29.6	3,152	37,450	128.39
AMO TEA COMPANY LIMITED	GB	3114	2,670	5,921	5.02	2,380	5,238	5.66
KONINKLIJKE ZEELANDIA GROEP B.V.	NL	3119	2,625	530,220	11.09	2,069	461,308	10.55
KRAS DD	HR	3119	2,623	154,590	2.67	2,507	144,889	3.06
MEALS FACTORY CONCORD COMPANY LIMITED.	RU	3119	2,581	121,740	146.66	830	72,475	-
SOLWAY FOODS LIMITED	GB	3114	2,555	254,109	113	2,231	302,004	-
THE LORENZ BAHLSEN SNACK WORLD GMBH & CO.KG	DE	3119	2,500	-	-	2,500	-	-
TER BEKE NV/SA	BE	3116	2,476	820,468	2.38	1,588	434,510	13.44
FREEMANS OF NEWENT LIMITED	GB	3116	2,472	651,358	0.94	216	79,383	18.84
GLOBINO MEAT-PROCESSING PLANT TOV	UA	3116	2,466	137,377	9.13	2,693	83,508	47.34
SNV	FR	3116	2,437	660,881	14.41	2,039	537,502	33.38
O.A. OBSHCHESTVO VELIKOLUKSKII MYASOKOMBINAT	RU	3116	2,425	543,399	-	2,385	215,926	-
JOINT-STOCK COMPANY FOOD ENTERPRISE LIMAK	RU	3118	2,413	100,886	10.93	2,525	90,320	27.7
GREENCORE PREPARED MEALS LIMITED	GB	3119	2,403	349,127	-1.78	2,129	404,740	31.96
DANONE PRODUITS FRAIS FRANCE	FR	3115	2,347	1,583,953	42.22	-	1,693,003	65.9
SMITHFIELD ROMANIA SRL	RO	3116	2,336	300,049	5.21	1,108	161,267	3.28
VEL PITAR SA	RO	3118	2,269	122,277	33.1	2,411	80,666	2.32
BONDUELLE EUROPE LONG LIFE	FR	3114	2,266	837,743	13.65	2,437	874,612	7.46
HKSCAN FINLAND OY	FI	3116	2,253	847,230	-23.19	2,502	831,372	-11.79
JOINT STOCK COMPANY PROGRESS	RU	3119	2,222	427,242	87.76	2,710	287,432	161.67
NESTLE HUNGARIA KFT	HU	3113	2,213	518,711	53.53	2,137	445,867	5.64
MONAGHAN MUSHROOMS LIMITED	GB	3114	2,206	346,139	-3.72	-	-	-
THORNTONS LIMITED	GB	3113	2,201	154,781	-	-	-	-
ROYAL GREENLAND A/S	DK	3117	2,200	843,619	21.42	1,263	724,131	15.19
NORTHERN FOODS GROCERY GROUP LIMITED	GB	3118	2,189	248,710	6.54	2,289	295,102	9.34
MPZ AGRO-BELOGORYE	RU	3116	2,184	304,638	7.88	103	239,838	-432.87
OTKRYTOE AKTSIONERNOE OBSHCHESTVO KARAVAI	RU	3118	2,156	106,769	0.03	2,309	117,994	19.24
CARGILL B.V.	NL	3113	2,152	5,199,179	17.2	1,997	5,428,138	14.98
TICAN FRESH MEAT A/S	DK	3116	2,102	1,172,727	29.6	-	-	-
UNILEVER DEUTSCHLAND PRODUKTIONS GMBH&CO.OHG	DE	3119	2,100	-	-	2,095	243,853	-
HARIBO PRODUKTIONS GMBH & CO. KG	DE	3119	2,100	-	-	-	-	-

Source: Orbis

Tabla IV. TOP 100 Firms with Trucost Low Environmental Risk


FIRM	COUNTRY	GUO COUNTRY	NAICS	TRUCOST ENVIRONMENTAL RATING CURRENT (%)	SIZE
CAKES & BAKES EDMONTON LTD	GB	GB	3118	0.50	S
T24 SEVEN LIMITED	GB	GB	3117	0.53	S
OLHAR PERDIDO, UNIPESSOAL, LDA	PT	-	3118	0.79	S
A SUTIZO KORLATOLT FELELOSSEGU TARSASAG	HU	HU	3118	0.94	S
BELIMO	FR	-	3113	1.12	S
AARDVARK PETCARE LTD	GB	GB	3111	1.26	S
LUSH DUBLIN LIMITED	IE	GB	3118	1.29	M
TOM MEEHAN & SONS LIMITED	IE	-	3118	1.29	M
LADRIGANS LIMITED	IE	-	3118	1.29	M
O'MAHONY SPA GLEN LIMITED	IE	-	3118	1.29	M
HERLIHYS OLIVER PLUNKETT STREET LIMITED	IE	-	3118	1.29	M
CONLON FOODS HALL LIMITED	IE	IE	3118	1.29	M
M & M MOORE LIMITED	IE	IE	3118	1.29	S
NADIA LIMITED	IE	IE	3118	1.29	M
PRISSMACK LIMITED	IE	IE	3118	1.29	S
TARA NOVA LIMITED	IE	-	3118	1.29	S
FINE FOODS & PHARMACEUTICALS N.T.M. S.P.A.	IT	IT	3119	1.44	VL
UUDENMAAN LEIPA OY	FI	FI	3118	1.81	M
HANSAFOOD OY	FI	FI	3118	1.81	M
OY ARVID NORDQUIST FINLAND AB	FI	SE	3118	1.81	L
KOUVOLAN LAKRITSI OY	FI	-	3118	1.81	M
PIRJON PAKARI YLIVIESKA OY	FI	FI	3118	1.81	M
PUNAISEN PIIPUN KIEVARI OY	FI	-	3118	1.81	M
LEIPOMO SAMIN PULLA OY	FI	-	3118	1.81	M
LOUNASKAHVILA-KONDITORIA MAINIO OY	FI	-	3118	1.81	S
KARAMELLA OY	FI	FI	3118	1.81	S
PR-WILENIUS OY	FI	FI	3118	1.81	S
N. OSTERBLAD INVEST AB	FI	FI	3118	1.81	S
COLIMAN OY	FI	FI	3118	1.81	S
MIKON KISKA OY	FI	-	3118	1.81	S
KAUPPAHALLIN KONDITORIA JA LEIPAMYYMALA OY	FI	FI	3118	1.81	S
PIRJON PAKARI RAISIO OY	FI	FI	3118	1.81	S
SUKLAINEN HERKKUJUONI OY	FI	FI	3118	1.81	S
PAVALNIEMEN KONDITORIA & CATERING OY	FI	FI	3118	1.81	S
MAKEIS-TIMPPA OY	FI	FI	3118	1.81	S
RINABET OY	FI	FI	3118	1.81	S
JENNIN HERKKUPALVELU OY	FI	FI	3118	1.81	S
PULLA PULLA LEIPOMO OY	FI	FI	3118	1.81	S
U:GIN MARENKI OY	FI	FI	3118	1.81	S
KARKKIKAUPPA PETRI KORHONEN OY	FI	-	3118	1.81	S
DOLLYN DONITSI OY	FI	FI	3118	1.81	S
LE-SWEET OY	FI	FI	3118	1.81	S
BREGMOS FINLAND AB	FI	SE	3118	1.81	S
TUHATLEHTI-MYYMALAT OY	FI	FI	3118	1.81	S
SWEET SURPRISE OY	FI	FI	3118	1.81	S
MAARIT JARVINEN OY	FI	-	3118	1.81	S
MALAX LOAF EXPORT LTD OY	FI	FI	3118	1.81	S
TUOMON LUOMU OY	FI	FI	3118	1.81	S
PERHEYHTIO PAAKKARIT OY	FI	-	3118	1.81	S
KULTASUKLAAMYYMALAT OY	FI	-	3118	1.81	S

FIRM	COUNTRY	GUO COUNTRY	NAICS	TRUCOST ENVIRONMENTAL RATING CURRENT (%)	SIZE
LCC SUKLAAPALA OY	FI	-	3118	1.81	S
AVERNIA OY	FI	FI	3118	1.81	S
LEIPOMO-KONDITORIA MIMMIN PULLA OY	FI	-	3118	1.81	S
CAFE ARTOR	FI	FI	3118	1.81	S
KARDINIA OY	FI	FI	3118	1.81	S
AB MIX-RIGHT OY	FI	-	3118	1.81	S
FUDGE LOVE OY	FI	GB	3118	1.81	S
RIEVAKYLAN LEIPALINJA OY	FI	-	3118	1.81	S
TR-TRAID OY	FI	FI	3118	1.81	S
KAKKUHelmi OY	FI	FI	3118	1.81	S
SUOMEN TOIMISTOAUTOMAATIT OY	FI	FI	3118	1.81	S
JERUSALEM LEIPOMO JA MAKEISET OY	FI	JO	3118	1.81	S
ESTFIN HERKUT OY	FI	FI	3118	1.81	S
DANATA OY	FI	FI	3118	1.81	S
PATISSERIE & CHOCOLATIER MAYRA OY	FI	-	3118	1.81	S
KARKKIPARKKI OY	FI	-	3118	1.81	S
POLARBERRIES OY	FI	FI	3118	1.81	S
PUBLINE OY	FI	FI	3118	1.81	S
PATRINOVA OY	FI	FI	3118	1.81	S
DARTEK OY	FI	FI	3118	1.81	S
EPU GROUP OY	FI	FI	3118	1.81	S
ANNA-MAJ OY ANNUKKA	FI	FI	3118	1.81	S
TAMMER LINE OY	FI	FI	3118	1.81	S
SS HERKKU OY	FI	FI	3118	1.81	S
CHAUD DIFFUSION	BE	BE	3118	2.18	L
WOUTERS BROOD & PATISSERIE	BE	BE	3118	2.18	L
PIERRE MARCOLINI BELGIUM	BE	FR	3118	2.18	L
DOLCE INVEST	BE	BE	3118	2.18	M
SILVER SOLUTIONS	BE	BE	3118	2.18	L
DELI MEIR	BE	BE	3118	2.18	M
LA MAISON DES DESSERTS	BE	-	3118	2.18	M
PHILIP'S BAKERY	BE	BE	3118	2.18	M
GALLER BOUTIQUES	BE	BE	3118	2.18	M
AU VIEUX TANCREMONT	BE	BE	3118	2.18	M
BELGIQUE GOURMANDE	BE	BE	3118	2.18	M
FLANDERS BAKERY SHOPS	BE	BE	3118	2.18	M
DISTRICHOC BELGIUM	BE	BE	3118	2.18	M
ANTWERP BAKERY SHOPS	BE	BE	3118	2.18	M
BEKODIS	BE	BE	3118	2.18	S
JMBB	BE	FR	3118	2.18	S
DELI VELDSTRAAT	BE	BE	3118	2.18	S
LA BRIOCHE D'OR	BE	BE	3118	2.18	S
PATISSERIE GERDY	BE	BE	3118	2.18	M
RAYFRAN	BE	BE	3118	2.18	M
BAKKERIJ VANBROEKHOVEN	BE	-	3118	2.18	S
BRUSSELS GRAND'PLACE	BE	BE	3118	2.18	S
KOCKADO	BE	BE	3118	2.18	S
SERVICES CENTER	BE	-	3118	2.18	M
WOUTERS - VERHEIJKE	BE	BE	3118	2.18	S
ALPHA NATIONAAL - ALPHA MEIR	BE	BE	3118	2.18	S
Total				1.79	

Source: Orbis

Tabla V. TOP 100 Firms with Trucost High Environmental Risk



FIRM	COUNTRY	GUO COUNTRY	NAICS	TRUCOST ENVIRONMENTAL RATING CURRENT (%)	SIZE
JOHN THOMPSON & SONS, LIMITED	GB	GB	3112	118.56	VL
OLYMPIC OILS LIMITED	GB	GB	3112	118.56	L
UM STORAGE LIMITED	GB	GB	3112	118.56	L
LINERGY LIMITED	GB	GB	3112	118.56	L
BENSONS PRODUCTS LIMITED	GB	GB	3112	118.56	M
PHOENIX SPECIALITY OILS LIMITED	GB	GB	3112	118.56	M
JUST OIL LIMITED	GB	GB	3112	118.56	S
FELIX DIRECT LTD	GB	GB	3112	118.56	S
MAYSO LTD	GB	GB	3112	118.56	S
NATURES CROPS INTERNATIONAL LIMITED	GB	-	3112	118.56	L
WYRE OILS LIMITED	GB	GB	3112	118.56	S
DUCHESS FARMS LIMITED	GB	GB	3112	118.56	S
THE COLD PRESSED OIL COMPANY LTD	GB	-	3112	118.56	S
MESSARA GOURMET PRODUCTS LTD	GB	GR	3112	118.56	S
THE EXTRA VIRGIN LIMITED	GB	GB	3112	118.56	S
AVOCET PROPELLANTS LIMITED	GB	GB	3112	118.56	S
KENTISH CONDIMENTS LIMITED	GB	GB	3112	118.56	S
GRANTS' FARM FOODS LTD	GB	GB	3112	118.56	S
CALEDONIAN OILS LIMITED	GB	GB	3112	118.56	S
ROIL FOODS LIMITED	GB	GB	3112	118.56	L
PURA FOODS LIMITED	GB	US	3112	118.56	L
OLAM FOOD INGREDIENTS UK LIMITED	GB	SG	3112	118.56	L
BASF PHARMA (CALLANISH) LIMITED	GB	DE	3112	118.56	L
NORTECH FOODS LIMITED	GB	DE	3112	118.56	L
YELO ENTERPRISES LTD	GB	GB	3112	118.56	L
BRENOR ENTERPRISES LIMITED	GB	-	3112	118.56	L
MODET LTD	GB	ES	3112	118.56	S
NIKATA LTD	GB	PL	3112	118.56	S
GREENACRE SMALLHOLDINGS LIMITED	GB	GB	3112	118.56	S
ALLIED FOODS LIMITED	GB	SE	3112	118.56	M
G.H. KLEIN & SON LIMITED	GB	GB	3112	118.56	S
UNICAO LIMITED	GB	SE	3112	118.56	S
NUTRITIONELLE LIMITED	GB	SE	3112	118.56	S
AARHUSKARLSHAMN HULL LIMITED	GB	SE	3112	118.56	M
CHAMBERS & FARGUS LIMITED	GB	SE	3112	118.56	S
KARLSHAMNS INTERNATIONAL PLC	GB	SE	3112	118.56	S
AARHUSKARLSHAMN LIMITED	GB	SE	3112	118.56	S
HELEN CORCORAN LTD.	GB	GB	3112	118.56	S
GLOBAL OIL COMPANY (EUROPE) LIMITED	GB	GB	3112	118.56	S
GOLD FROM THE WOLD LIMITED	GB	GB	3112	118.56	S
LA BANDIERA LIMITED	GB	NZ	3112	118.56	S
SUMMER HARVEST LIMITED	GB	GB	3112	118.56	S
HAMMOND FOOD OILS LIMITED	GB	GB	3112	118.56	S
LARCHWOOD FOODS LIMITED	GB	GB	3112	118.56	S
COTSWOLD GOLD LIMITED	GB	GB	3112	118.56	S
AGROBASE TRADING LIMITED	GB	GB	3112	118.56	S
AGRO PRODUCE UK LIMITED	GB	GB	3112	118.56	S
NHC HEALTH AND WELLBEING LIMITED	GB	GB	3112	118.56	S
TRADE IN COMMODITIES LTD	GB	IT	3112	118.56	S
GEARS OIL LIMITED	GB	GB	3112	118.56	S

FIRM	COUNTRY	GUO COUNTRY	NAICS	TRUCOST ENVIRONMENTAL RATING CURRENT (%)	SIZE
ALKYONA LIMITED	GB	GB	3112	118.56	S
SHOPSEGGIANO LTD	GB	GB	3112	118.56	S
GOLDEN CROP LTD	GB	GB	3112	118.56	S
STONY ENERGY LTD	GB	IE	3112	118.56	S
AMYRIS PLANTS OIL LTD	GB	GB	3112	118.56	S
TASTEXPLORERS - OILVIE LIMITED	GB	GR	3112	118.56	S
GENNI OILS LIMITED	GB	GB	3112	118.56	S
MATRIX FIX NUTRITION LTD	GB	-	3112	118.56	L
KNIGHTSBRIDGE GROUP HOLDING LIMITED	GB	AU	3112	118.56	S
WANXIANG HOLDINGS PLC	GB	CN	3112	118.56	M
MOMIN OIL UK LIMITED	GB	PK	3112	118.56	S
EURO OLIVE LIMITED	GB	GB	3112	118.56	S
MAMAS BLENDS LIMITED	GB	GB	3112	118.56	S
P&P GREEN UK HOLDINGS LTD	GB	GB	3112	118.56	VL
EASY CBD LIMITED	GB	GB	3112	118.56	S
FAT PRESS LTD	GB	GB	3112	118.56	S
ELSA'S ORGANIC SKINFOODS LIMITED	GB	-	3112	118.56	S
IFFCO INGREDIENTS LIMITED	GB	-	3112	118.56	S
MERCY OIL LIMITED	GB	GB	3112	118.56	S
VALLEYOILS LTD	GB	GB	3112	118.56	S
GENESIS GROUP GLOBAL LTD	GB	DK	3112	118.56	S
INSECT TECHNOLOGY GROUP SERVICES UK LIMITED	GB	GB	3112	118.56	S
INSECT TECHNOLOGY GROUP RESEARCH UK LIMITED	GB	GB	3112	118.56	S
INSECT TECHNOLOGY GROUP LIMITED	GB	GB	3112	118.56	S
VIRTUTUM LIMITED	GB	GB	3112	118.56	S
INFINITY LINKS MANAGEMENT LIMITED	GB	-	3112	118.56	S
CBDM ENTERPRISE LIMITED	GB	-	3112	118.56	S
MULTICYCLE TECHNOLOGIES UK LIMITED	GB	GB	3112	118.56	S
PLAZOIL (UK) LTD	GB	GB	3112	118.56	S
VITAOIL INTERNATIONAL LTD	GB	GB	3112	118.56	S
ADVANCED XTRACTS LTD	GB	GB	3112	118.56	S
EDIBLE OILS FACTORY LIMITED	GB	GB	3112	118.56	S
SPECIALIST PRESSING & MILLING LTD	GB	GB	3112	118.56	S
THE GREAT BRITISH LINSEED COMPANY LTD	GB	GB	3112	118.56	S
CBD LIFESTYLE LTD	GB	GB	3112	118.56	S
FARMHOUSE NATURAL FOODS LTD.	GB	GB	3112	118.56	S
WORLEYBEARD LIMITED	GB	GB	3112	118.56	S
UK TOPLINE OIL TECHNOLOGY CO., LTD.	GB	CN	3112	118.56	S
SELBI LTD	GB	TR	3112	118.56	S
AVA FOODS LIMITED	GB	GB	3112	118.56	S
METROFUELS HOLDINGS LTD	GB	ZA	3112	118.56	S
BAY HORSE LABORATORIES LTD	GB	GB	3112	118.56	S
FLAVOIL CAPITAL LTD	GB	UA	3112	118.56	S
DUNCRUE FOOD PROCESSORS LIMITED	GB	GB	3112	118.56	M
CARDOWAN CREAMERIES LIMITED	GB	-	3112	118.56	M
MACKINTOSH OF GLENDAVENY LIMITED	GB	GB	3112	118.56	M
ARROCCO LIMITED	GB	RU	3112	118.56	S
P.A.TOVARISTVO DNIPROVSKII KROKHMALPATOKOYI K.	UA	UA	3112	93.51	VL
OPEN JOINT STOCK COMPANY MASLOZHIRKOMBINAT K.	RU	RU	3112	93.51	VL
PAYMAR PAMUK YAGI VE MARGARIN TICARET VE SANAYI A.	TR	TR	3112	93.51	M
Total				117.81	

Source: Orbis

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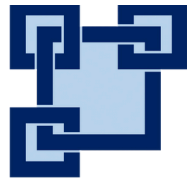
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