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Measuring Competitiveness of Agro-Food Industries

THE SWISS CASE

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Abstract

MEASURING COMPETITIVENESS OF AGRO-FOOD INDUSTRIES: THE SWISS CASE

This paper presents an assessment of the competiveness performance of Swiss food industries. The approach taken here is to measure revealed performance, relying on indicators such as market performance, trade success and revealed comparative advantage indicators. The analysis of competitiveness examines the *ex post* performance of the industry in Switzerland compared to the same industry in benchmark countries in the European Union.

This paper served as the basis for Chapter 4 of the *OECD Review of Agricultural Policies: Switzerland 2015*.

Keywords: Agro-food industries, international competitiveness, Switzerland.

JEL: L6; L66

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Glossary and acronyms

BFS	Bundesamt für Statistik (Switzerland)
bn	Billion
Billion	1 000 000 000 = 10^9
Eurostat	EU statistics database
Eurostat-SBS	Eurostat Structural Business Statistics
FAO	Food and Agriculture Organization of the United Nations
FAOstat	The Statistics Division of the FAO
NACE	Nomenclature générale des Activités économiques dans les Communautés Européennes (European Classification of Economic Activities)
NOGA	General Classification of Economic Activities of Switzerland
Million	1 000 000=10^6
OECD	Organisation for Economic Co-operation and Development
RMA	Relative Import Advantage index
RTA	Relative Trade Advantage is the difference between RXA and RMA
RXA	Relative Export Advantage index

Country abbreviations

AT	Austria
CH	Switzerland
DE	Germany
ES	Spain
EU	European Union
FR	France
IT	Italy
NL	Netherlands
UK	United Kingdom

Executive Summary

This report presents an assessment of the competiveness performance of Swiss food industries. The approach taken here is to measure revealed performance, relying on indicators such as market performance, trade success and revealed comparative advantage indicators. The analysis of competitiveness examines the *ex post* performance of the industry in Switzerland compared to the same industry in benchmark countries in the European Union.

The method relies on data that are available in many countries from public sources. This feature renders the method potentially applicable in other countries, and provides a way to assess the performance of national food industries and provides a basis for assessing their participation in global value chains.

Competitiveness of the food industry is defined as the sustained ability to achieve profitable gains and maintain market share in domestic and export markets in which the industry is active. The selected indicators to quantify the competitiveness of an industry are trade related indicators (market shares on the world market and trade specialisation) and economic performance indicators (annual growth rates of real turnover, labour productivity and shares in total manufacturing). These indicators recognise the competition on world market as well as competition for means of production on the domestic market.

As competitiveness is a relative concept, the performance of the Swiss food industries is compared with the food industries in benchmark countries. The selected EU countries, which are the main market for the Swiss food industry, represent 86% of the Swiss export value to the EU and 89% of Swiss import value from the EU.

The competitiveness of the Swiss food and beverage industry is almost entirely driven by sub-branches that source most of their raw material inputs abroad or where inputs are non-agricultural (mineral water). The turnover of cocoa and chocolate manufacturing grew annually by 10%, almost twice as fast as the overall food and beverages industry (5.8%) in the period 2001-2011. Together with beverages this industry counts for 72% of the exports of the Swiss agro-food industry.

The weakest sectors are meat and dairy processing, which mainly rely on domestic primary agriculture for their inputs. These industries as well as the weak animal feed sector, have to pay relatively high prices for their material inputs, well above the EU price levels. Additionally, these less competitive sectors have a relatively low growth of labour productivity and are relatively labour intensive.

1. Introduction

As part of the 2013-14 OECD Programme of Work and Budget of the Committee for Agriculture, the OECD undertook an evaluation of agricultural policy reforms in Switzerland. The study assessed the economic and environmental impacts of agricultural policies, considering the implementation of policy reforms since the mid-1990s. The study also contained an evaluation of competitiveness of the Swiss food industry. The OECD study was published in March 2015 (OECD, 2015)

This report describes in more detail the methods employed to assess the competitiveness of Swiss agro-food industries which was developed in a background report by LEI Wageningen UR. The background report applies a similar method as used in Wijnands et al. (2007, 2008) that evaluated the competitiveness of the EU food industry at member state level and in comparison with the United States, Australia, Brazil and Canada.

As competitiveness is a relative concept, the performance of the Swiss food industries are compared with the food industries in benchmark countries. Because the EU is the main market for the Swiss food industry, the study compares Switzerland with selected EU countries.

This report provides a detailed description of the methodology used to assess the competitiveness of the Swiss food industry and provides the main results for the whole food and beverage industry and for various subsectors of the food industry. The structure of the report is as follows:

- Chapter 2 elaborates the approach method and data.
- Chapter 3 presents the competiveness assessment for the Swiss food & beverages industry in total and the largest sub-sector "Other food products" All other subsectors are concisely presented in Annex 2.
- Chapter 4 addresses the conclusions and discussion.

2. Competitiveness assessment: Method and data

This chapter presents first the competiveness concept, the indicators used and the method of assessing competitiveness. Second, the data sources are discussed. Third, the selection of the EU-benchmark countries is presented.

2.1. Competitiveness: Comparison of indicators of a specific entity

Although competitiveness does not have a precise definition in economic theory, it can be understood as the ability to successfully face competition. In this sense, competitiveness is the ability to sell products that meet demand requirements (price, quality, quantity) and, at the same time, ensure profits over time that enable the firm to thrive. Competitiveness is a relative concept and should be measured with respect to a benchmark. Competition may be within domestic markets (in which case firms within one sector or entire sectors in the same country are compared with each other) or international (in this case, comparisons are made between countries). An illustration of the complexity of the concept is found in (Spence and Hazard, 1998):

> "The problem of international competitiveness has been defined in highly diverse ways. These definitions (and the proposed solutions to the problem) are partially inconsistent, and thoroughly confusing to most academics, politicians, policy-makers, and business managers. There is good reason for this confusion. The collection of problems alluded to as "competitiveness" is genuinely complex. Disagreements frequently occur not only at the level of

> empirical effects and of policies, but also in the very definition of the problem. Well-intentioned and reasonable people find themselves talking at cross purposes; sometimes it almost seems they are addressing different subjects."

Sagheer et al. (2009) present an overview of various approaches for assessing competitiveness. Their overview, by far not exhaustive, shows that competitiveness is measured on different entity levels and by different theories. The theories differ from strategic management approaches generally applied at firm or business unit level (e.g. Thompson and Strickland, 2003; Wright et al., 1998) to international economics comparing the performances of countries (e.g. Krugman and Obstfeld, 2006; Siggel, 2006). This study focuses on countries and industries: the competitiveness of the Swiss food industry benchmarked against the industry in selected third countries. Therefore, focus is on indicators derived from the theory of international economics and emphasise productivity differences as drivers for competitiveness (Krugman and Obstfield, 1988; O'Mahoney and Van Ark, 2003)

According to Porter, sustainable competitive advantage is the fundamental source for above-average performance in the long run (Porter, 1980; Porter, 1990). In line with Porter's viewpoints, competitiveness of the food industry is *defined as the sustained ability to achieve profitable gain and maintain market share in domestic and export markets in which the industry is active*.

As competitiveness is a broad concept and there is no general agreement on how to define it or how to measure it precisely, studies often adopt own definitions and chose a specific measurement method. Measurement can identify revealed performance, relying on indicators such as market performance, trade success, revealed comparative advantage indicators, etc. (Latruffe, 2010). In this study, competitiveness is the ex post performance of an industry in one country compared to the same industry in benchmark countries. The approach of O'Mahoney and van Ark (2003) is followed by measuring performance as the growth of indicators in a certain period. Below the selection of indicators is discussed.

2.2. Competitiveness indicators: Based on international economics

In this section, the indicators selected to be used in this study are summarised. A distinction is made between trade and the economic performance indicators of competitiveness. The selection of indicators is mainly based on previous work of Wijnands et al. (2007, 2008), Latuffe (2010) and Frohberg and Hartmann (1997).

Trade related indicators

In Wijnands et al. (2007) raw materials as well as processed products are included in assessing the competitiveness of the food industry. In this earlier work trade in raw materials is seen as a determinant of the competitiveness of the primary sector, while processed products are linked to the competitiveness of the processing industry. The present report revisits that approach and distinguishes between processed and raw materials. To that end, the UNComtrade product codes are linked to the NACE industry codes.[1] The revision envisages selecting only processed products from the trade database for assessing the food industry's competitiveness for the "trade" indicators.[2]

1. The correspondence table is based on: unstats.un.org/unsd/trade/conversions/HS%20Correlation%20and%20Conversion%20tables.htm.

2. To correct for the influences of consumer price inflation, real values of variable expressed in monetary terms are obtained by deflating them with the consumer price index (2005=100) of the World Development Indicators database.

Market shares on the world market

The export share on the world market is a straightforward performance indicator and it reflects the outcome of the international competitive process. The difference is taken between two periods of a country's export share on the world market. The growth is measured as the change and not an annual growth rate between two periods, as used for other indicators. Growth rates of market shares between two periods have a strong flaw. Very small exporters can have large growth rates, but remain small exporters. Conversely, even with small growth rates, large exporters will have a larger impact on the market. The definition of this indicator reflects the strong interdependency between the exports of the different countries. By taking the absolute change, the real impact on the world market is taken into account. Furthermore, the total sum of all changes of market shares is by definition zero. Table 2.1 gives an example of the discussion above taken from (Wijnands, 2007).

Table 2.1. Example of impact of indicators and market shares development

	Market share (%)			
	1996-1998	2002-2004	Change	Growth
Country A	1	2	1	100%
Country B	50	51	1	2%
Country C	20	20	0	0%
Country D	29	27	-2	-7%

The mathematical formulation is as follows:

$$(1)\ GES_{ict} = MS_{ict_1} - MS_{ict_2}$$

GES_{ict} Growth export share on the world market for industry i for country c between period t_1 and t_2

MS_{ict} Export share on the world market for industry i for country c in period t

c Selected country

i Selected industry according to classification of NACE

t Selected year

$$(2)\ MS_{ict} = X_{ict} \Big/ X_{iwt}$$

X_{ict} The export value of industry i, country c in period t.

X_{iwt} The export value of industry i of the world (as a whole) in period t.

Revealed comparative advantage indices

The relative importance of an industry in the total trade is usually measured by the Revealed Comparative Advantage (RCA) also called Balassa or specialisation index (Fertö and Hubbard, 2003; Latruffe, 2010; Wijnands, 2008). If it is related to the export, it measures the export share of a product of one country in the total export of the world relative to the country's export share in the world of all products. The relative export advantage index is as follows:

(3) $RXA_{ict} = \dfrac{X_{ict} / X_{iwt}}{XT_{ct} / XT_{wt}}$ Export value of specific industry i from country c in period t.

RXA_{ict} The relative export advantage index for industry i, country c in period t.

X_{ict} The export value of industry i, country c in period t.

XT_{ct} The total export value of all industries of country c in period t.

XT_{wt} The total export value of all industries in the world in period t.

The total export value of all industries from one country is the total of all export: unprocessed or processed agriculture commodities, or industrial products or services.

A potential flaw of this index is that re-export might suggest high competitiveness of one industry. These transit activities might be influenced by a good performance of another industry, i.e. logistics or by beneficial geographical or infrastructural conditions like sea- or airports.

A RXA index of 1 indicates that a country is equally specialised as the total world exports. A level below 1 means relatively unspecialised and above 1 relatively specialised. The latter indicates an export advantage, as relatively more is exported than the world average. In fact it indicates the export focus of an industry and is therefore externally oriented. Again the annual growth between the first and last time period will be used. The index is only relevant for exporting industries.

The opposite of the relative export advantage index is the relative import advantage index:

(4) $RMA_{ict} = \dfrac{M_{ict} / M_{iwt}}{MT_{ct} / MT_{wt}}$ Import value of specific industry i from country c in period t.

RMA_{ict} The relative import advantage index for industry i, country c in period t.

M_{ict} The import value of industry i of country c or of the world w in total in period t.

MT_{ct} The import value of all industry i of country c or of the world w in total in period t.

The interpretation of the index is reversed from that of RXA. A value below unity (=1) shows that a country imports less than the world average and can be indicated as a competitive advantage; a value above unity indicates a relative higher import level.

High levels or re-export of products, due to comparative advantage of other sectors or country's location, might explain a high value.

The Relative Trade Advantage index is defined by Scott and Vollrath as difference between the RXA and RMA (Scott and Vollrath, 1992).

(5) $RTA_{ict} = RXA_{ict} - RMA_{ict}$

A positive RTA indicates a competitive advantage: the exports exceed the imports. Negative values signify competitive disadvantages (Scott and Vollrath, 1992).

The advantage of these indices is the simplicity to calculate these indicators based on readily available data. In this report, the values of all three indices are presented. As metrics in the assessment of the competiveness, the absolute growth between 2 periods of the Relative Trade Advantage will be used as this index summarises the export and import developments. This index has an advantage above the indices based on either export or imports (Frohberg and Hartmanm, 1997). This indicator is a modification of the approach of Wijnands et al. (2008). A positive growth indicates an increase in domestic supply of that product, meaning that the industry gains competitiveness compared to other countries.

Other indices based on trade

Several other indicators related to international trade are available, such as the Net Trade Ratio that expresses the ratio between imports and exports of a country, or the Grubel-Loyd intra-industry trade index, Porter-adapted index of RXA or the Dunning adapted RXA. Furthermore, several modifications of the indices mentioned above are discussed in the literature (Frohberg and Hartmanm, 1997; Gellynck, 2002; Latruffe, 2010). These indices are not considered as the export and import advantage indices whose interpretation is less complicated in terms of competitiveness. The Porter and Dunning index include outward and inbound production. This index is not considered as data from national accounts are used that include only domestic production, as presented below.

Economic indicators

The selected indicators for quantifying the industry's competitiveness are taken from Wijnands et al. (2008). A major disadvantage when assessing the Swiss food competitiveness is data availability (see below): the preferred measure is value added but data on this variable could not be retrieved and therefore the turnover has been used as a proxy. Data that are fully comparable with those of EU countries are available only for the period 2009 to 2011.

Due to insufficient data, turnover is used, as value added was not available, unless otherwise stated. Therefore, in this section both indicators are indicated by the same acronym.

Growth of real turnover

Creating added value is an important economic indicator. It is related to the industrial dynamism. Total value added is not only based on the production factor labour but also on the production factor capital and land. In the study, real turnover of the food industry (or sub-industry) is used as proxy for value added. The annually growth is taken as an indicator, so that countries can be compared despite differences in purchasing power parity.

To derive the real turnover, the nominal turnover is deflated by the consumer price index.

$$(6)\quad RTO_{ict} = \frac{TO_{ict}}{CP_{ct}}$$

RTO_{ict} Real turnover for industry i in in country c for period t

TO_{ict} Nominal turnover for industry i in country c for period t

CP_{ct} Consumer price indicator for country c in period t

Real turnover shares in the manufacture industry

The importance of a specific sub-industry is derived from its turnover share in the food industry. A growth in the share reflects a competitive advantage. The industry is then able to attract resources for their production. This reflects the competition for production factors (labour and/or capital) between different industries within a country.

The manufacturing industry is used for comparison, both for a sub-industry of the food industry, e.g. dairy processing, or the food industry as a whole. The metrics is the growth of the turnover share of the specific industry in the food industry. A positive growth shows a better than average performance than the food industry as a whole.

$$(7)\ SRTO_{ict} = \frac{RTO_{ict}}{RTO_{mct}}$$

$SRTO_{it}$ Share of the real value added/ turnover for industry i in total manufacturing industry (m) in country c for period t

m Manufacturing industry as a whole

Labour productivity based on real turnover

Labour productivity affects prices in the market. Growth of labour productivity improves industrial competitiveness in international markets. Labour productivity is often seen as a crucial determinant of competitiveness. Labour productivity is the real value added (or turnover) divided by the number of employees. This indicator cannot be compared between different countries due to different levels of Purchasing Power Parities. As the growth rate of labour productivity is taken, the indices of different countries can be compared.

$$(8)\ RLP_{ict} = \frac{RTO_{ict}}{E_{ict}}$$

RLP_{ict} is real labour productivity for industry i in country c for period t

E_{ict} is number of employees in industry i in country c for period t

Exchange rates

All indicators are growth percentages. Growth percentages are not influenced by exchange rates, so they can be calculated in the original currency. The nominal values in the descriptive parts are all converted to euros with the exchange rate as published by Eurostat.

Competitiveness assessment and presentation

Annual growth rates of the indices

According to Porter, sustainable competitive advantage is the fundamental source for above-average performance in the long run (Porter, 1980; Porter, 1990). In line with this view, competitiveness of the food industry is defined as the sustained ability to achieve profitable gain and market share in domestic and export markets in which the industry is active. Annual growth rates (except for market shares on the world market and for the relative trade advantage index) between two periods are used as indicators. High growth rates indicate high ex post performance, compared to other industries of a particular country.

Comparison of indicators and overall competition

The food industries will be benchmarked against a number of selected countries. The above-mentioned indicators have different scales. To compare the different scales the values are standardised around the mean by using a Z-transformation:

X_i is observation i=1,n (ic number of countries)

$$\overline{X} = \sum X_i \Big/ n$$

$$s = \sqrt{\frac{\sum (X_i - \overline{X})^2}{n}}$$

$$z_i = \frac{X_i - \overline{X}}{s}$$

As a result of this transformation all variables will have the same scale and are dimensionless and can then easily be presented in one figure. Furthermore, the mean of these values can be calculated as an indication of the overall competitiveness. In this case, the implicit assumption is that all indicators have equal weight or importance. While it is possible to impose different weights for each indicator, no empirical evidence is currently available that would provide a basis for using different weights.

However, this method also has a disadvantage. The standard scores depend on the number of the countries and the levels of indicators in the sample: the standard scores are not fixed. It is in fact a benchmark, and if the benchmark countries or the level of one indicator in one country changes, the position of the countries will also change. It is a relative position.

Annex 1 provides for the food industry the calculated values and Z-score of the indicators for the food industry.

2.3. Data sources and industry classification

Industry classification

The industry classification is taken from the EU NACE rev. 2 system, which is used from 2005 onward. Before 2005, the NACE rev. 1.1 system was in force. The two systems are linked together based on the correspondence table provided by Eurostat (EC, 2008). The NACE system distinguished industries at a 4-digit level. In this report, the analyses are based on a 3-digit level. Switzerland has a similar system called NOGA. In 1995, the Swiss Federal Statistical Office adopted the European NACE system. "Therefore, both classifications are identical up to level 4 ... " p6 (FSO, 2008). Table 2.2 presents the industries taken into account. Level "C" manufacturing is used as benchmark for the food industry. As beverages are not part of the food industry C10 in the NACE rev 2 system, but is in the NACE rev 1.1 system and in the NOGA system, C11 is added (which is identical to C110) to C10 as "Food total".

Table 2.2. Industries taken into account according to the NOGA/NACE classification

#	NACE/ NOGA	Description	Short name
1	C	Manufacturing	Manufacturing total
2	C10 (+C11)	Manufacture of food and beverages products Eurostat does not include C11 beverages in C10, in the NACE rev1.1, beverages were a part of the food industry just as in FBS NOGA statistics.	Food total
3	C101	Processing and preserving of meat and production of meat products	Meat
Not included	C102	Processing and preserving of fish, crustaceans and molluscs	Seafood
4	C103	Processing and preserving of fruit and vegetables	Fruit and vegetable
5	C104	Manufacture of vegetable and animal oils and fats	Oils and fats
6	C105	Manufacture of dairy products	Dairy
7	C106	Manufacture of grain mill products, starches and starch products	Cereals and starches
8	C107	Manufacture of bakery and farinaceous products	Bakery
9	C108	Manufacture of other food products	Other food
10	C109	Manufacture of prepared animal feeds	Animal feeds
11	C110	Manufacture of beverages	Beverages

Data sources

This section discusses the main data sources for assessing the competitiveness of the Swiss food industry: Trade data and Structural Business data. Next to these two main sources other public accessible statistics are used, for instance from the FAO (FAOstat) or from the World Bank (World Development Indicators).

Trade flows: UNcomtrade data

Trade data for all countries are taken from UNComtrade database. That database provides a consistent set of data for trade flows of products for all countries. In this study however, the focus is on industries as aggregation of enterprises and not on commodities or products. Therefore, the codes of commodities have to be linked to the industries codes (see above) in a correspondence table. Based on that aggregation, the market share and trade advantage indices are calculated for the selected sub-industries. Raw materials trade is not linked to the business data; processed foods are only linked to the food industries and sub-industries.

EU structural business statistics

The data source for the business economic data for EU countries is the Structural Business Statistics (SBS) from Eurostat. This database provides data for all countries of the EU. The NACE rev 1.1 is used from 1995 to 2008 and the NACE rev 2 version is used from 2008 to 2011. This database provides the information for the economic indicators (see above). In addition, this database provides similar data of the Swiss food industry for the years 2009-2011, but not for previous years. Data for previous years are selected from other sources. For the EU countries, the period 2001 to 2011 is used.

Swiss Value Added Tax (Mehrwertsteuer) data

Swiss companies have no legal obligations to file their accounts, like most EU countries. Public quoted companies make their financial statements available and in general, these are the source to construct national account data. However, the national accounts distinguish industries at 2-digit level: e.g. "C10 Manufacture of food products" and as a consequence, data for the food industry at 3-digit level is lacking. The value added tax statistics (BFS, 2013) as well the employment statistics (see website STAT-TAB in reference list) provide information at 3-digit NOGA level.

The tax statistics provide annual information from 1995 onwards on a number of enterprises and turnover[3]. However, due to revision of the tax law a trend break occurred in 2009. For 2008, observations for the old and new system are available. As the series for the old system was until 2008, corrected the data of the new system with the ratio between the old and new system in 2008. This ratio has been calculated for each sub-sector of the food industry. In this way, a time series was constructed indicating the turnover and number of firms for the period 1995 until 2011.

The labour statistics provide information for 1995, 2001, 2005 and 2008, restricting the possibilities of choosing years for comparison. Because of the labour data availability, economic data for the period 2001-2008 for Switzerland for the labour productivity is used. For other economic indicators the period 2001 to 2011 is used.

2.4. Benchmark countries selected on trade relation

As competitiveness is a relative concept, the performance of the Swiss food industries should be compared with the food industries in benchmark countries. Because the EU is by far the main market for the Swiss food industry, the study compares Switzerland with selected EU countries. The benchmark countries are selected on the following criteria:

- Countries that have a strong trade relationship with Switzerland;
- EU countries that have a comparable level of GDP per capita.

A "strong" trade relationship is defined as export to an EU country above 5% of the total exports to the EU or the imports from an EU country above 5% of the total imports of the EU by Switzerland. The selected benchmark countries represent 86% of the total export to the EU-28 and 89% of all imports.

Table 2.3. Agricultural Swiss export to other countries and import by Switzerland in 2012

#	Country	Export		Import	
		(Million USD)	(%)	(Million USD)	(%)
2	Austria	299	5.7	380	4.4
3	France	1 017	19.3	1 689	19.4
4	Germany	1 421	26.9	1 959	22.5
5	Italy	485	9.2	1 785	20.5
6	Netherlands	367	7.0	855	9.8
7	Spain	386	7.3	833	9.6
8	United Kingdom	542	10.3	215	2.5
	Other EU countries	757	14.3	976	11.3

Source: (Calculation based on) UNComtrade.

3. The turnover statistics in Switzerland include enterprises with a minimum turnover of CHF 100 000. Enterprises with less turnover are not considered.

Values of import from and export to EU countries by Switzerland provide information on the agricultural trade relationships. Trade concerns all agricultural products within the code HS 01 to HS 23. Table 2.3 provides an overview of the EU countries that meet the aforementioned definition. This selection includes all neighbouring countries and the largest countries in the EU-15.

In 2012, Switzerland had a GPD per capita of USD 79 000, higher than all EU countries except for Luxembourg. Regarding the second selection criterion, Italy and Spain might be included as well, due to rather low GDP per capita. Excluding Italy results in excluding an import trade partner and neighbouring country. This would not be desirable for the analysis. Spain is slightly less important as trade partner compared to Italy, but Spain is included as well as a benchmark country. The countries in Table 2.3 represent 86% of the Swiss export value to the European Union and 89% of the Swiss import value from the European Union.

Table 2.4 presents a few characteristics of Switzerland and the benchmark countries. Of all selected countries, Switzerland has the smallest population and smallest area of agricultural land. A relatively small population indicates a relatively low demand for food. The land area per capita indicates the domestic production possibilities of raw materials: in Switzerland it is at the same level as Germany and Italy, above the area per capita in the Netherlands and below the other countries.

Table 2.4. Characteristic of the economies of Switzerland and benchmark countries in 2012

	Country	Population	GDP	GDP/capita	Agricultural land (in 2011)	
		(Million)	(Billion USD)	(1 000 USD)	(Million ha)	Sq. Metres/ capita
1	Switzerland	8.0	631.2	78.9	1.5	1 904
2	Austria	8.5	394.7	46.6	2.9	3 390
3	France	65.7	2 612.9	39.8	29.1	4 428
4	Germany	81.9	3 428.1	41.9	16.7	2 042
5	Italy	60.9	2 014.7	33.1	13.9	2 287
6	Netherlands	16.8	770.6	46.0	1.9	1 130
7	Spain	46.2	1 323.0	28.6	27.5	5 957
8	United Kingdom	63.2	2 471.8	39.1	17.2	2 715

Source: World Development Indicators.

3. Competitiveness of the Swiss food industries

3.1. Swiss food industries: An overview

Structure of the food industry

"Other food" manufacturing accounts for the majority of the Swiss food industry's turnover and exports. The group other food "includes the production of sugar and confectionery, prepared meals and dishes, coffee, tea and spices, as well as perishable and specialty food products" (EC, 2008). The dairy industry has the most enterprises and is second in turnover. Beverages manufacturing takes a quarter of the exports and imports of the processed food. In terms of turnover and trade, manufacturing of "other food" determines the food industry with a share of 60% in the total turnover of the food & beverage industry. Other important sectors are dairy (12% share in the food industry), meat (10%) and beverages (8%). The remaining sub-industries count for 12% of the total turnover. However these remaining industries have a significant share of 42% in the number of employees and are dominated by relatively small scale firms (Table 3.1.).

Table 3.1. Key-figures of the Swiss food industry[a]

NACE	Manufacturing Industry	Enterprises 2011		Turnover 2011		Employees 2008		Export 2012		Import 2012	
		Number	%	Billion EUR	%	1 000	%	Million USD		Million USD	
C10&11	Food total	2 410	100	41.6	100	73.1	100	7 889	100	8 237	100
C101	Meat	257	10.7	4.1	9.9	11.9	16.3	113	1	943	11
C103	Fruit and vegetable	67	2.8	0.7	1.7	2.2	3.0	224	3	714	9
C104	Oils and fats	21	0.9	0.4	1.0	0.4	0.5	83	1	385	5
C105	Dairy	768	31.9	4.9	11.8	8.2	11.2	761	10	516	6
C106	Grain and starches	89	3.7	0.6	1.4	1.3	1.8	11	0	93	1
C107	Bakery	219	9.1	2.1	5.0	14.6	20.0	728	9	743	9
C108	Other food	471	19.5	24.4	58.7	15.1	20.7	3 896	49	1 760	21
C109	Animal feeds	142	5.9	1.3	3.1	1.9	2.6	214	3	575	7
C110	Beverages	367	15.2	3.2	7.7	7.1	9.7	1 851	23	1 901	23

[a] Sum of sub-sector differs from Food total, because C102 "Processing and preserving of fish, crustaceans and molluscs" is not included.

Source: LEI calculation based on FBS and UNComtrade.

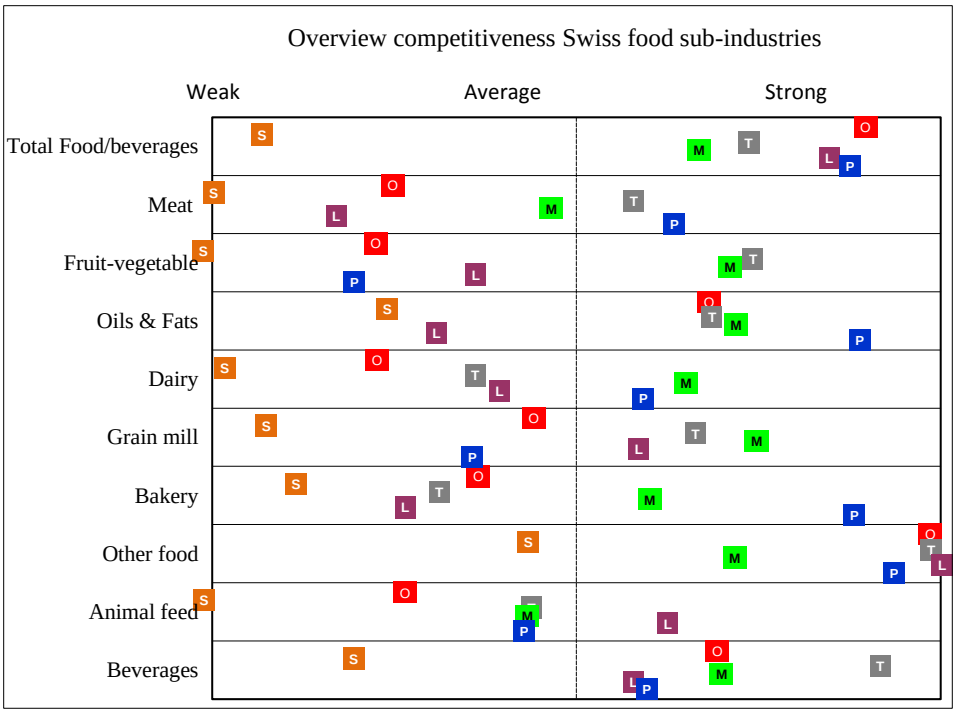
The Swiss food industry is a net exporter of "other food" products and dairy products. Other food manufacturing (C108) amounts to around 59% of the turnover and half of the exports. The sub-industry "Processing and preserving of fish, crustaceans and molluscs" C102 is not included in the study. This industry has a substantial import: 7% of total food industry imports. The Swiss food industries are "specialised importers" of beverages and bakery products: the Relative Import Advantage (RMA) indices are above unity in 2012: 1.6 and 1.2 respectively. On the other hand, they are also specialised exporters with a Relative Export Advantage (RXA) indices above unity for beverages (RXA=1.3) and other food products (RXA=1.8) in 2012. For "other food" and dairy the Swiss food industry is a net exporter. Table 2.3 above presents the trade relations with the selected EU-countries

Competitiveness of all sub-sectors

Figure 3.1 presents the competitiveness of all sub-industries of the Swiss food industry. Some observations are:

- The growth of the turnover share of each food industry or sub-industry in total manufacturing (S) is below average, despite the strong growth of the food industry. The growth of the manufacturing industry was higher than of the food industry. The competitiveness for means of production is thus strong. In this respect, the overall food industry is weak. However, this weak position did not hamper the industry to have above growth levels of the turnover (P), meaning that the food industry is able to attract sufficient means of production by paying a competitive price.
- The share on the world market (M) increased for most of the industries and sub-industries because of higher export rates than world average: meat and feed is below average.
- The competitiveness of the food & beverage industry is largely based on the sub-industry "other food" that had a large share (Table 3.1) in the total turnover and a strong growth rate.

Figure 3.1. Competitiveness of the Swiss food sub-industries benchmarked against selected EU countries[a]



[a] Z-scores based on comparison per industry with the benchmark countries.

Legend:	O	Overall competitiveness
	S	Annual growth share turnover in manufacture industry 2001-2011
	T	Difference in RTA indicator 2012 minus value 2000
	M	Difference world market share 2011 minus 2000
	L	Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
	P	Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

The sections below present a detailed competitiveness assessment of the food industry in total as well for the largest subsector: "other food", the overall assessment each sub-industry is presented in Annex 2.

Supply base and self-sufficiency

Table 3.2 shows that two-thirds of the turnover (other food and beverages) of the Swiss food industry is weakly linked to the primary sector. Specific information on self-sufficiency and on prices of raw materials are presented in Annex 2, with a concise overview of all sector not discussed in this chapter.

Most farmers' prices are above the level of the selected countries in the EU. For several products, these prices are converging to the EU level. Farmers' prices of pig and cattle meat are however diverging from the EU level. The self-sufficiency is for most processed products below 100%: Switzerland is a net importer. Only for "other food" products Switzerland is a strong exporter; for dairy it is a small exporter.

Given the importance of especially the chocolate industry and to a lesser extent the soft drinks and bottled mineral waters, it can be said that the Swiss food competitiveness is "*cocoa and water"* based.

Table 3.2. Overview of raw material supply and self-sufficiency

Product	Production raw materials	Price raw materials	Self-sufficiency
Meat	• Cattle and pig meat declining • Poultry strongly increasing	• All above benchmark countries • Poultry prices converging • Cattle and pig meat diverging	• Not self-sufficient in meat • Net importer of meat products
Fruit and Vegetables	• Little information available, relatively small production • Apples and Potatoes declining	• Apples above EU, below the UK level. Diverging • Potatoes above EU level, converging	• Net importer of processed products • Net exporter of apples Net importer of potatoes • Twenty per cent self- sufficiency in tomatoes
Oils and fats	• Few oilseeds produced • Rapeseed slightly increasing	• Above EU countries, converging	• Net importer of oils and fats
Dairy	• Milk production slightly increasing	• Above EU countries, converging	• Net exporter of dairy products
Grain mill and starches	• Wheat is largest product • Wheat production declined slightly	• Above EU countries, converging • Price peak in 2008 mitigated in Switzerland	• Net importer of grain mill and starches products
Bakery	• See grain mill		• Very small net importer
Other food	• Mainly footloose based on imported products such as cocoa		• Large net exporter • Net importer of sugar
Animal feed	• No information		• Net importer, especially oil cakes
Beverages	• Stable production of wine grapes • No specific information for other raw materials	• Prices of grapes are far above the EU level	• Small net importer of beverages • Self-sufficient in grapes for wine

3.2. Manufacturing of food & beverages products

Manufacturing of foods products (NACE code C10) includes the processing of the products of agriculture, forestry and fishing into food for humans or animals, and includes the production of various intermediate products that are not directly food products. Beverages products are added to this category. The category beverages (NACE code C11) includes manufacture of beverages, such as non-alcoholic beverages and mineral water, manufacture of alcoholic beverages mainly through fermentation, beer and wine, and the manufacture of distilled alcoholic beverages (EC, 2008).

The overall competitiveness (O) of the Swiss food industry is the strongest of all selected countries, due to a strong "other food manufacturing" sector. The main developments indicate that:

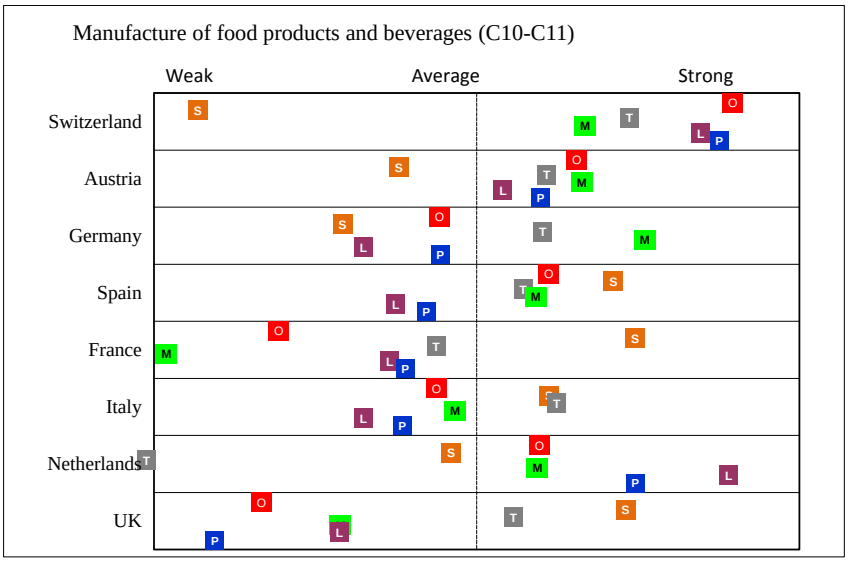
- The share of the turnover of the food industry in total manufacture (S) declined in Switzerland and Germany. Other countries showed a growth, the small growth rate in Austria and the Netherlands were below average. The food industry's share (9.6%) in the manufacturing turnover is among the lowest and almost half the level of Spain or the Netherlands.
- The growth rate of the real turnover (P) of the food is the strongest and above the levels of the Netherlands (second strongest) and Austria (third).
- The growth rate of the labour productivity (real turnover per employee (L)) is also the strongest compared to all benchmark countries except the Netherlands.

- The change in the Swiss Relative Trade Advantage (T) index is above average. Switzerland remained a small net importer of food products. The export grew at a higher level than the imports.
- The performance of the export share on the world market (M) of Switzerland is above average: Switzerland gained market share. Germany gained a significant share of 0.5%. France – one of the leading EU exporters – lost market share.

In addition, the following observations are made:

- The total turnover of the Swiss food industry grew quicker than all selected countries. However, the total turnover is among the smallest of all countries, just like the population size.
- "Other food" manufacturing (C108) is most competitive and takes two-thirds of the turnover and half of the exports. It is the most important food-manufacturing sub-sector (Section 3.3). The sub-sector chocolate manufacturing grew rapidly and had a share of around 50% in the turnover in 2011 in the "other food" sector.
- The distribution of the firm sizes is skewed: the 3% largest firms account for 60% of the turnover.

Figure 3.2. Competitiveness of the food & beverages industry (detailed data in Annex 1)



Legend:
- O Overall competitiveness
- S Annual growth share turnover in manufacture industry, 2001-2011
- T Difference in RTA indicator 2012 minus value 2000
- M Difference world market share 2011 minus 2000
- L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
- P Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

Structure and economic indicators of the food processing industry

The Swiss food industry is one of the smallest of all selected countries in terms of turnover and number of enterprises. However, in turnover it is 2.5 times the Austrian food industry: both countries have the lowest population with around 8 million inhabitants. The growth of the turnover is the highest of all countries as is the average turnover per enterprise.

Table 3.3. Structure of the food & beverages industry in 2011

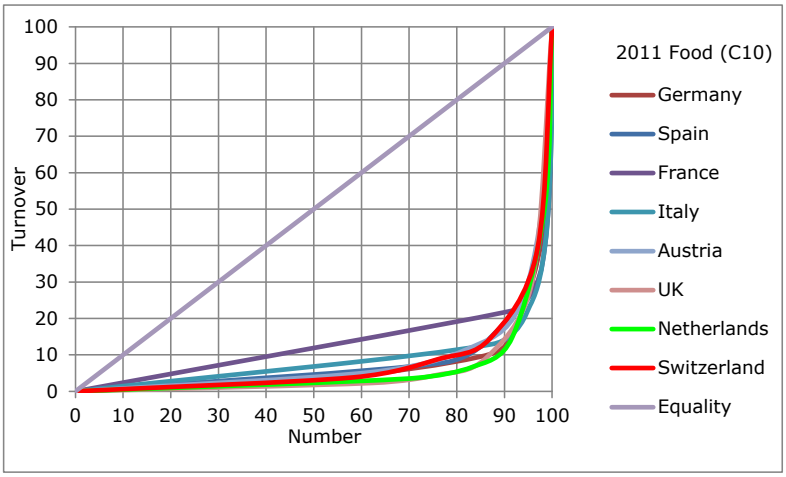
Country	Turnover		Enterprises		Average turnover per enterprise		Employees	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1 000	Growth[a] (%)
Switzerland[a]	41.6	5.8	2 410	-1.0	17.3	6.8	73.1	0.0
Austria	19.3	4.6	3 837	-1.0	5.0	5.7	77.5	-0.1
Germany	180.4	2.4	32 204	-1.0	5.6	3.4	887.5	0.8
Spain	101.5	3.6	27 722	-1.3	3.7	5.0	365.9	-0.1
France	168.9	1.9	59 405	-1.2	2.8	3.1	604.4	-0.4
Italy	124.3	2.5	58 074	-1.6	2.1	4.2	433.5	0.0
Netherlands	62.9	3.7	4 477	-1.2	14.1	5.0	125.3	-2.5
United Kingdom	105.8	0.0	7 492	-0.3	14.1	0.2	376.3	-3.0

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

The distribution of the firm sizes is skewed: the 3% largest Swiss firms count 60% of the turnover, the 13% largest counts 80 (2009) to 85% (2012). The skewedness increased in the period 2009 to 2011. Furthermore all Swiss food sub-industries show such skewedness as well as the food industries in most other countries. For this reason, the size and turnover distribution for the food industry sub-industries will not be discussed further.

Figure 3.3. Lorenz curve of number of firms and turnover of the food industry (beverages excluded)



Source: Based on Eurostat.

Despite the strong growth of the turnover of the food industry, other manufacturing grew at a higher pace and hence the share of the food industry in the manufacturing industry declined in the period 2001-2011. In all other selected countries except Germany, the share of the food industry remained at the same level or increased. Second, the labour productivity

increased with almost the highest growth percentage far above all other countries. Only the Netherlands showed a slightly higher growth pace.

Table 3.4. Share of food industry in manufacturing and labour productivity (based on turnover)

Country	Share in manufacturing turnover			Labour productivity (EUR 1 000 turnover per employee)		
	2001 (%)	2011 (%)	Growth[a] (%)	2001	2011	Growth[a] (%)
Switzerland[a]	11.8	9.6	-2.0	319	482	6.1
Austria	11.0	11.1	0.2	153	191	2.2
Germany	9.6	9.2	-0.4	165	167	0.1
Spain	17.5	21.6	2.1	193	208	0.8
France[a]	14.8	18.8	2.4	212	226	0.6
Italy	11.7	13.5	1.4	216	219	0.1
Netherlands	18.9	20.3	0.7	255	483	6.6
United Kingdom	14.3	17.9	2.3	202	195	-0.3

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.
Source: Eurostat for EU countries and BFS for Switzerland.

Trade in food products and trade indicators

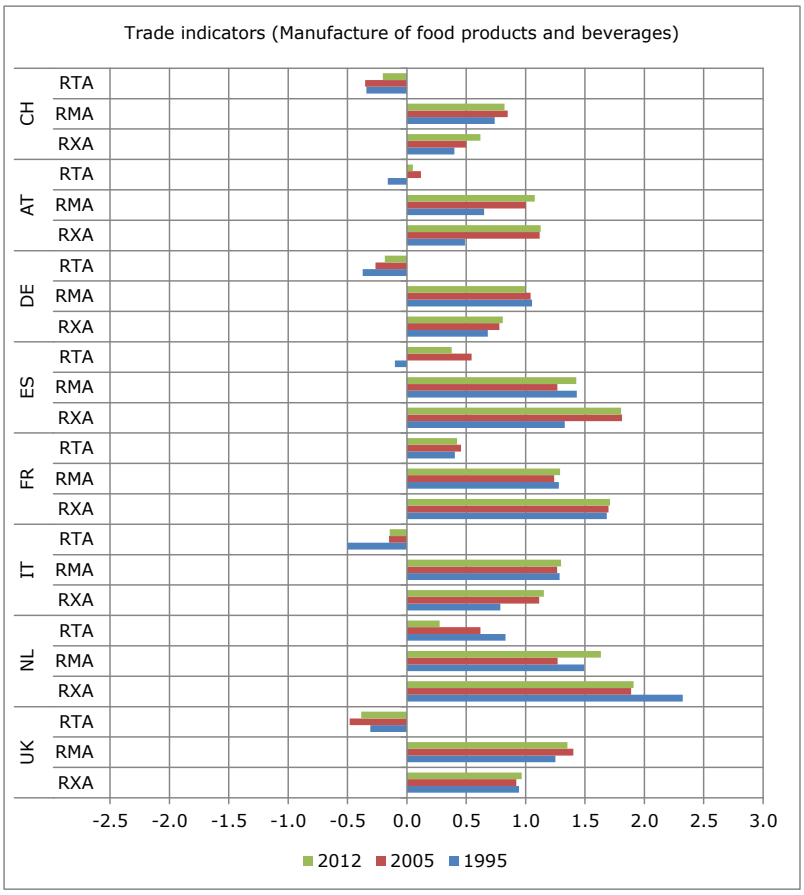
The export of processed food and beverages products of Switzerland grew fast (15.2%) and above the world average (12.6%). The share on the world market increased. On the other hand, the Swiss import grew less than world average resulting in a smaller share as importer of food from the world market. Switzerland is a small trader, just as Austria with shares of around 1% on the export or import world market: the other countries have higher shares. As largest exporter and importer, Germany has shares of 7%. France has lost its position: the export share decreased from 8.5% in 2000 to 6.0% in 2012. The UK is the largest net importer and the Netherlands the largest net exporter of the selected countries. The export-import balance is slightly negative for Switzerland, which is a net importer. The Relative Trade Advantage for Switzerland is just smaller than -0.2, indicating a non-specialised importer.

Table 3.5. Trade and market shares in food and beverages products

Country	Export				Import			
	Export 2012 (Million USD)	Growth 2000 - 2011 (%)	Market share 2000 (%)	Market share 2011 (%)	Import 2012 (Million USD)	Growth 2000 - 2011 (%)	Market share 2000 (%)	Market share 2011 (%)
Switzerland	7 889	15.2	0.6	0.9	8 237	9.2	1.1	1.0
Austria	10 069	13.9	0.9	1.1	9 248	12.1	0.9	1.1
Germany	64 446	12.5	6.4	7.1	59 075	10.2	7.4	7.1
Spain	29 024	11.1	3.1	3.0	23 520	9.7	3.2	2.9
France	53 620	7.8	8.5	6.0	43 276	9.1	5.9	5.0
Italy	32 574	10.2	4.0	3.6	32 122	9.0	4.7	3.9
Netherlands	59 633	11.3	6.8	6.7	41 461	12.9	3.7	4.6
United Kingdom	26 212	7.7	4.2	2.9	47 147	8.2	6.9	5.3

Source: LEI calculation based on UNComtrade

Figure 3.4. Processed food and beverage trade indicators



Source: LEI calculations based on UNComtrade.

3.3. Manufacture of "other food" products

This group "other food" (Nace code C108) "includes the production of sugar and confectionery, prepared meals and dishes, coffee, tea and spices, as well as perishable and specialty food products" (EC, 2008). With59% share in the total food processing industry this is the largest sub-sector. The overall competitiveness (O) of the Swiss "other food" processing industry (C108) is very strong compared to the benchmark countries. The main developments indicate that:

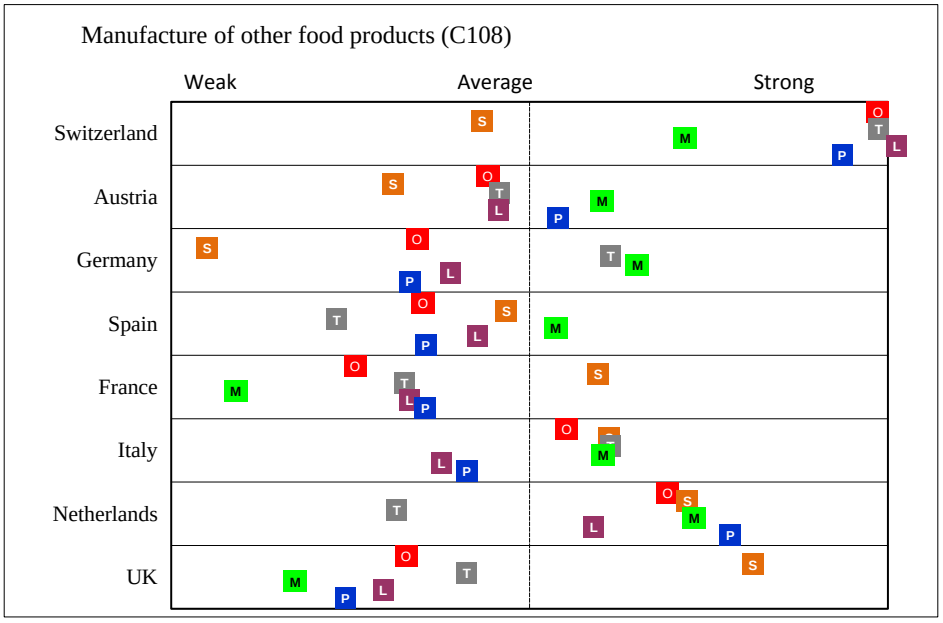
- The share of the turnover of the "other food" products industry in total manufacture (S) increased in Switzerland, however stronger in several benchmark countries. Thus, Switzerland is performing lower than average on this indicator.
- The growth of the real turnover (P) of the "other food" industry is rather strong and the highest of all selected countries.
- The growth of the labour productivity (real turnover per employee (L)) is strong above average. In the period 2001 to 2008, the growth was 14% annually far above the second in rank: the Netherlands with a growth of 3% annually.
- The Relative Trade Advantage (T) index of Switzerland outperforms all other countries. Switzerland is a net-exporter of "other food" products.

- In addition, the performance of the export share on the world market (M) of Switzerland is the strongest.

In addition, the following observations are made:

- The sub-industry "other food products" is a rather diverse industry and includes among others manufacturing of sugar, chocolate, tea, coffee, condiment, seasonings, prepared meals, food preparations and dietetic food. It is the largest food sub-industry in turnover, employment and trade.
- Cocoa and chocolate manufacturing takes around half of the turnover of the "other food" industry. This industry is largely footloose: the raw materials are imported.
- The Swiss average turnover per enterprise is the highest of all selected countries: 3 to 15 times higher than in other countries.

Figure 3.5. Competitiveness of the "other food products" industry



Legend: O Overall competitiveness
S Annual growth share turnover in manufacture industry 2001-2011
T Difference in RTA indicator 2012 minus value 2000
M Difference world market share 2011 minus 2000
L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
P Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

Structure and economic indicators of the "other food" processing industry

The turnover of the "other food" industry in Switzerland grew extremely fast: 10% annually, far above the levels of other countries that also have significant growth figures. The number of enterprises grew at a slower pace resulting in a strong growth of the average turnover per enterprise. The Swiss average turnover is 2.5 times higher than in the Netherlands and Germany (the second and third highest) and 15 times higher than in Italy (the

lowest). Despite this turnover growth, the number of employees declined only in Switzerland. In addition, Switzerland ranks third in the total turnover after Germany and France.

Table 3.6. Structure of the "other food" industry in 2011

Country	Turnover		Enterprises		Average turnover per enterprise		Employees [a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1,000	Growth[a] (%)
Switzerland[a]	24.4	10.0	471	3.1	51.9	6.7	15.1	-0.6
Austria	2.1	5.5	175	5.2	11.8	0.2	7.3	2.3
Germany	30.9	1.8	1 455	7.2	21.2	-5.0	101.5	1.3
Spain	10.8	3.6	2 480	-2.4	4.3	6.1	45.6	0.7
France	25.7	2.3	3 737	5.9	6.9	-3.4	79.5	3.2
Italy	19.9	4.0	5 443	1.7	3.7	2.3	57.6	3.0
Netherlands	11.3	6.8	521	5.5	21.7	1.2	22.4	4.1
United Kingdom	19.6	2.1	1 242	-0.2	15.8	2.3	92.3	2.2

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

The industry "Manufacture of other food products", NACE C108, is a rather diverse industry and is subdivided into 7 sub-industries (see table 3.7). Almost half of the turnover comes from the cocoa and chocolate manufacturing in 2011. The share of this sub-industry grew strongly from 20% in 2001 to 47% in 2011 of the total of the "other food" industry. It will be clear that the turnover of sub-industry cocoa and chocolate manufacturing grew extremely: 18% annually. Switzerland exports mainly luxury chocolate products (an export value share of over 90%) with relatively high prices. Also Germany the largest exporter of cocoa based products has a high share (over 80%) in the high value products. The Netherlands, the second largest exporter of the benchmark countries, has a more diversified export portfolio with 40% of luxury products and the remaining part mainly as intermediate processed commodities like cocoa butter, paste or powder.

Table 3.7. Distribution of the sub industries of the "Manufacture of other food products" industry

NOGA/NACE	Description	2001		2011	
		Number (%)	Turnover (%)	Number (%)	Turnover (%)
108	Manufacture of other food products	100.0	100.0	100.0	100.0
1082	Manufacture of cocoa, chocolate and sugar confectionery	24.8	22.4	21.4	48.1
108201	*Manufacture of cocoa, chocolate*	11.8	19.6	*13.6*	*46.8*
108202	*Manufacture of sugar confectionery*	13.0	2.8	*7.8*	*1.4*
1083	Processing of tea and coffee	18.4	2.3	16.7	2.0
1084	Manufacture of condiments and seasonings	8.1	4.0	5.7	0.7
1085	Manufacture of prepared meals and dishes	17.0	0.9	7.2	2.5
1086	Manufacture of homogenised food preparations and dietetic food	8.1	2.1	9.3	0.7
1089; 1081	Manufacture of sugar and Manufacture of other food products n.e.c.	23.6	68.3	39.6	45.9

Source: BFS Mehrwertsteuer Schweiz.

The industry is largely footloose: the raw materials have to be imported and are not produced in the country itself, such as cocoa, tea or coffee. Hence, the raw materials base is also rather diverse, mainly based on imports or intermediate products from other industries. Sugar beets are grown in Switzerland, but the country is a net-importer of refined sugar. The self-sufficiency of refined sugar equivalents is around between 50 and 60%.

The Swiss share of the "other food" industry in total manufacturing was already the highest of all selected countries and increased. However, the annually growth was in most of the other countries even stronger compared to total manufacturing. In Swiss labour productivity (real turnover per employees) is by far the highest of all countries and the growth of this indicator outperforms all other countries.

Table 3.8. Share of "other food" industry in manufacturing and labour productivity (based on turnover)

Country	Share in manufacturing turnover			Labour productivity[a] (EUR1 000 turnover per employee)		
	2001 (%)	2011 (%)	Growth[a] (%)	2001	2011	Growth[a] (%)
Switzerland[a]	4.7	5.6	1.9	587	1 497	14.3
Austria	1.1	1.2	1.0	200	215	0.7
Germany	1.7	1.6	-1.0	275	250	-1.0
Spain	1.8	2.3	2.2	177	177	0.0
France[a]	2.2	2.9	2.8	333	261	-2.4
Italy	1.6	2.2	2.9	300	264	-1.3
Netherlands	2.5	3.6	3.8	363	485	2.9
United Kingdom	2.1	3.3	4.5	207	147	-3.3

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland

Trade in "other food" and trade indicators

Switzerland strengthened its position on the export market, due to an above average growth rate: the world market grew with 13.9%, the Swiss export with 16.4% in the period 2000-2011. Switzerland is a net exporter. Compared to the other benchmark countries, the Swiss trade is among the smallest: Germany, the Netherlands and France exports and imports are significant higher levels.

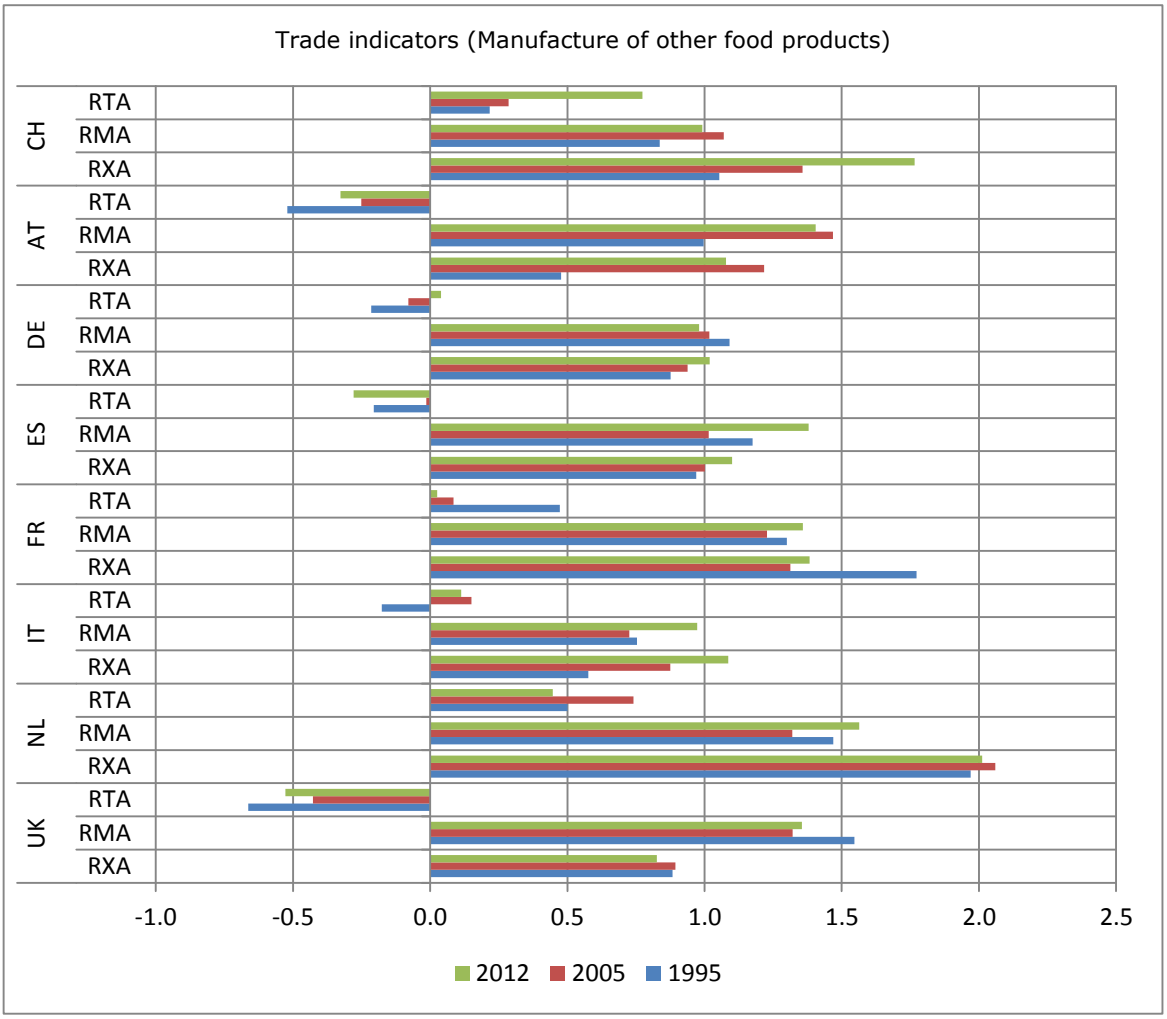
Table 3.9. Trade and market shares in "other food"

Country	Export				Import			
	Export 2012 (Million USD)	Growth 2000 - 2011 (%)	Market share 2000 (%)	Market share 2011 (%)	Import 2012 (Million USD)	Growth 2000 - 2011 (%)	Market share 2000 (%)	Market share 2011 (%)
Switzerland	3 896	16.4	1.7	2.5	1 760	11.3	1.3	1.2
Austria	1 672	13.2	1.0	1.1	2 138	12.5	1.3	1.3
Germany	14 093	13.0	8.4	8.8	10 308	11.1	7.4	6.5
Spain	3 072	10.9	2.2	1.9	4 030	12.9	2.7	2.8
France	7 519	7.9	7.4	4.7	8 078	10.8	6.0	5.1
Italy	5 323	12.8	3.1	3.1	4 270	12.3	2.6	2.6
Netherlands	10 896	13.8	6.2	7.0	7 030	14.6	3.8	4.7
United Kingdom	3 883	6.0	4.6	2.4	8 370	8.8	7.3	5.1

Source: LEI calculation based on UNComtrade

The aforementioned developments are reflected in the trade indicators presented in Figure 3.6. The Relative Export Advantage (RXA) index for Switzerland is above unity: the country is a specialized exporter. The Relative Trade Advantage (RTA) indicator almost tripled from 0.3 in 1995 to 0.8 in 2012. Also France and the Netherlands have a RXA above unity (=1). In addition, these countries are also specialised importers of "other food": the Relative Import Advantage (RMA) is also above unity. These countries are thus relatively specialised in trade of "other food" products. Austria, Spain, France and the United Kingdom are net-importers. Some have negative values for RTA. The data shows that the competitiveness of Switzerland on the world market increased.

Figure 3.6. Trade indicators of the "other food" industry



Source: LEI calculations based on UNComtrade.

4. Discussion and conclusions

4.1. Strong industries: Export focused and footloose resource base

The three strongest industries are "other food", "beverages" and "oils and fats". The first two industries count for 72% of the exports. A major part of the raw materials is imported (e.g. cocoa) or non-agricultural (mineral water). The oils and fats industry is strongly linked to the "other food" industry as supplier of intermediate products to produce condiments,

seasonings or meals. On the other hand, the weakest industries, meat, dairy and animal feed are largely based on domestic resources.

4.2 Objective of the study limited

The main objective of this study is an ex post performance assessment of the competiveness of Swiss agro-food industries. Furthermore, this study provides information on the structure of the Swiss food industry and its raw materials base. Unanswered questions are for instance: are the small sub-industries small because their weak competitiveness in the past? Are the industries weak because of the prices of raw materials?

4.3 Economic data sources weak for Switzerland

In economic studies, added value is used for assessing competitiveness. The data sources did not provide this information for the sub-industries of the food industry on a 3 or 4-digit level. The impact on the competitiveness is unclear.

4.4 Conclusions

In the aggregate, the Swiss food and beverage industry appears to be very strong compared to the selected EU countries. On four of the five indicators, the Swiss food and beverage manufacturing ranks the strongest or among the strongest. An exception is the share in manufacturing: Swiss is the weakest on this indicator. The turnover of the Swiss food industry grew the fastest of all selected countries. Nevertheless, the food industry lost share in total manufacturing. The total manufacturing grew even faster.

The picture of strong aggregate competitiveness is driven by the performance of other food manufacturing (C108) which takes around 60% of the turnover and half of the exports. Almost half of the turnover of this industry comes from the cocoa and chocolate manufacturing in 2011. This sub-industry's turnover grew annually even with 10%: almost twice as fast as the overall food & beverages industry (5.8%) in the period 2001-2011

Industries that are strongly linked to the local agriculture are performing the weakest: meat, fruit and vegetables, dairy and animal feed. Most farmers' prices are above the level of the selected countries in the European Union. For several products, these prices are converging to the EU level. Farmers' prices of pig and cattle meat are diverging from the EU level.

The size distribution of the firms is skewed: the 3% largest Swiss firms counts 60% of the turnover, the 13% largest counts 85% in 2012. A similar skewedness can be observed for the EU-benchmark countries. Nevertheless, the average turnover per enterprises is the highest of all countries.

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www.pxweb.bfs.admin.ch/Dialog/varval.asp?ma=px-d-06-2J05&ti=Institutionelle+Einheiten+und+Besch%E4ftigte+nach+Kanton+und+Wirtschaftsart+%28BZ%29&path=../Database/German_06%20-%20Industrie%20und%20Dienstleistungen/06.2%20-%20Unternehmen/&lang=1&prod=06&openChild=true&secprod=2

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Eurostat :Structural Business Statistics (SBS)
epp.eurostat.ec.europa.eu/portal/page/portal/european_business/data/database

from HS codes to SITC codes for matching trade product data to industry data:
unstats.un.org/unsd/trade/conversions/HS%20Correlation%20and%20Conversion%20tables.htm

Correspondence tables between NACE rev. 1.1 and NACe rev. 2:
epp.eurostat.ec.europa.eu/portal/page/portal/nace_rev2/correspondence_tables

Annex 1

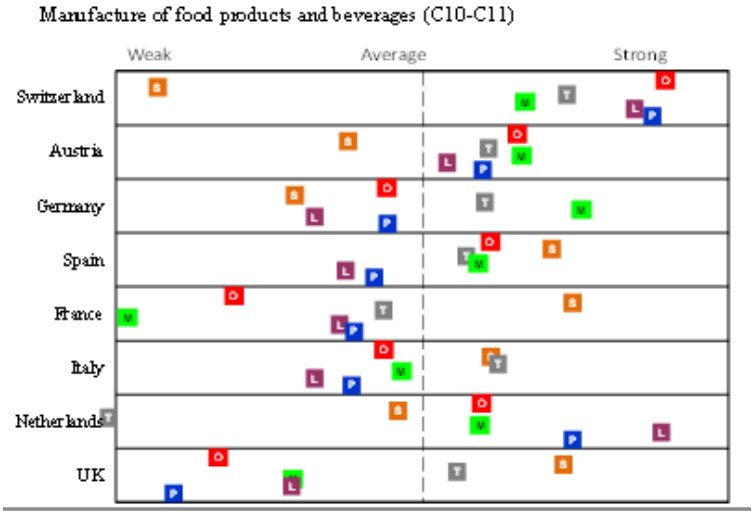
Competitiveness graphs based on Z-scores

The competitiveness graphs in Section 3 present the values of the indicators as Z-scores. A "Z-score" of 0 means an average score, a negative Z-score a weak score and a positive Z-score means a strong score. This has the advantage that all variables have the distribution with a mean of 0 and a standard deviation of 1. In this way the indicators can be compared. To illustrate the impact, Table A1.1 presents the values and Z-scores of the indicators for the food and beverages sector (C10 +C11) the Z-scores are depicted in the figure below.

Table A1.1. Values of indicators and Z-scores

		Switzerland	Austria	Germany	Spain	France	Italy	Netherlands	UK
O = Overall	Average Z-scores	0.56	0.20	-0.05	0.13	-0.43	-0.06	0.11	-0.47
	Z-score	1.68	0.59	-0.15	0.39	-1.27	-0.17	0.33	-1.39
S = Annual growth share turnover in manufacturing	Value	-2.00	0.16	-0.45	2.14	2.37	1.44	0.72	2.27
	Z-score	-1.84	-0.44	-0.83	0.85	1.00	0.40	-0.07	0.93
T = Difference RTA indicator	Value	0.20	0.04	0.03	0.00	-0.11	0.06	-0.69	-0.02
	Z-score	0.96	0.38	0.36	0.22	-0.18	0.45	-2.34	0.15
M = Difference world market share	Value	0.26	0.24	0.70	-0.10	-2.60	-0.46	-0.09	-1.31
	Z-score	0.64	0.62	1.06	0.30	-2.05	-0.04	0.31	-0.84
L = Annual growth rate labour productivity	Value	6.06	2.25	0.13	0.76	0.64	0.13	6.60	-0.34
	Z-score	1.46	0.08	-0.69	-0.46	-0.50	-0.69	1.65	-0.85
P = Annual growth rate real added value	Value	5.53	2.19	0.88	0.62	0.23	0.18	3.96	-3.32
	Z-score	1.59	0.34	-0.15	-0.25	-0.39	-0.41	1.00	-1.72

Figure A1.1. Competitiveness of the food & beverages industry



Legend:

O	Overall competitiveness
S	Annual growth share turnover in manufacture industry, 2001-2011
T	Difference in RTA indicator 2012 minus value 2000
M	Difference world market share 2011 minus 2000
L	Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
P	Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

Additional remarks

- Some positive values of the indicators will lead to negative Z-scores. For instance, Austria realised a growth (S) on the world market of 0.16%: the difference of the share in 2012 (1.14%) and the share in 2000 (0.88%) on the world market. The Z-score is negative, as the average growth of the share of all countries was 0.8%, and thus Austria performs weaker than the average of all countries. Figure A1.1 provides the graphs of the Z-scores. That figure shows that not only Switzerland and Germany with negative values on the growth of the world market (S) are weak, but also countries that score below average such as Austria and the Netherlands. An indication "strong" only means that a country has an above average value. For instance, all countries might have negative values on an indicator. The strongest country means that that country performed better than all others and the Z-score will be on the right side.
- The "O" overall value is the average of the Z-scores of the 5 indicators. This value is also standardised in Z-scores, meeting the requirement of a mean of 0 and a standard deviation of 1. The result might be that the overall score is outside the Z-scores of the individual scores. This is visible in the "O" (overall) score of Switzerland. Switzerland is by far the strongest of all countries on the overall competitiveness.
- By standardising the values, most Z-scores will be in the interval "-2" to "+2". For instance, the high values for labour productivity growth (L) of Switzerland and the Netherlands are within that range. However, some indicators are outside that interval. These values are depicted on the border of the interval -2.2 to + 2.2 of the graphs. An example is the difference of the Relative Trade Advantage indicator (T) for the Netherlands; the Z-score -2.34, thus smaller than -2.2. In the Figure above it can be seen that Z-scores are depicted outside the left border. The Z-score of the French market share (M)-2.05 is just inside the interval.

Annex 2.

Competitiveness, structure and raw material based on food processing subsectors

Meat and meat products

This subsector processing and preserving of meat and production of meat products (NACE code C101, (EC, 2008)) counts for round 10% of food & beverage industry's turnover and is third largest.

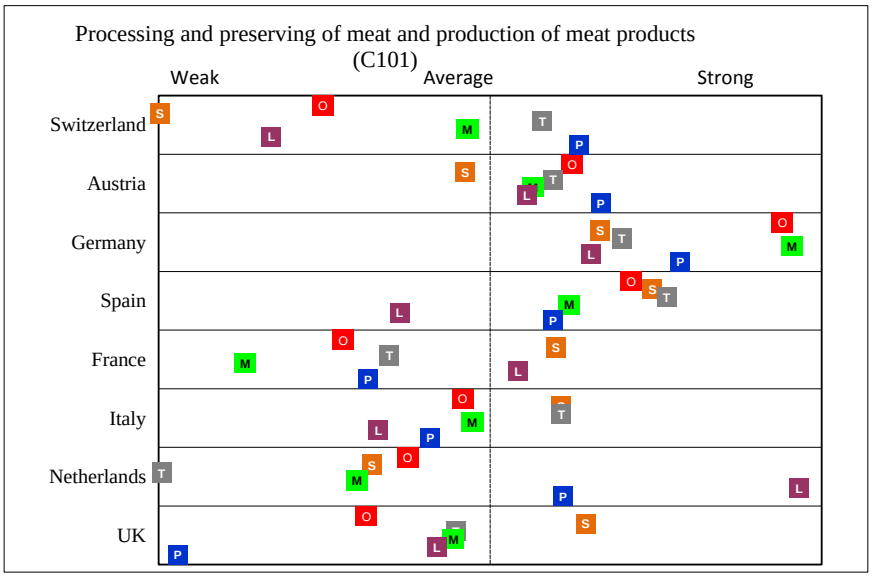
The overall competitiveness (O) of the Swiss meat processing industry is the weakest of all selected countries. The main developments indicate that:

- The Swiss share of the turnover of the meat industry in total manufacture (S) declined considerably: Switzerland performed as weakest.
- The growth of the real turnover (P) of the meat industry is above average and on the same level as Austria, Spain and the Netherlands.
- The growth of the labour productivity (real turnover per employee (L)) is also the weakest compared to all benchmark countries.
- The Swiss Relative Trade Advantage (T) index was stable and is above average. Switzerland remained a net-importer of meat products.
- The performance of the export share on the world market (M) of Switzerland is just below average: Switzerland gained an insignificant small market share (0.1% points). Germany gained a significant share from 5 to 9% (4% points).

In addition, the following observations are made:

- The raw material supply for the Swiss meat industry declined for cattle and pig meat and increased for poultry meat in the period 1991-2011.
- The farmers' prices in Switzerland are higher than those in the EU countries. The pig meat farmers' prices are converging and for other cattle and chicken meat, the price difference increased.
- The Swiss average turnover per enterprise is third in rank after the Netherlands and UK and significantly higher than the Swiss neighbouring countries.

Figure A2.1. Competitiveness of the meat industry

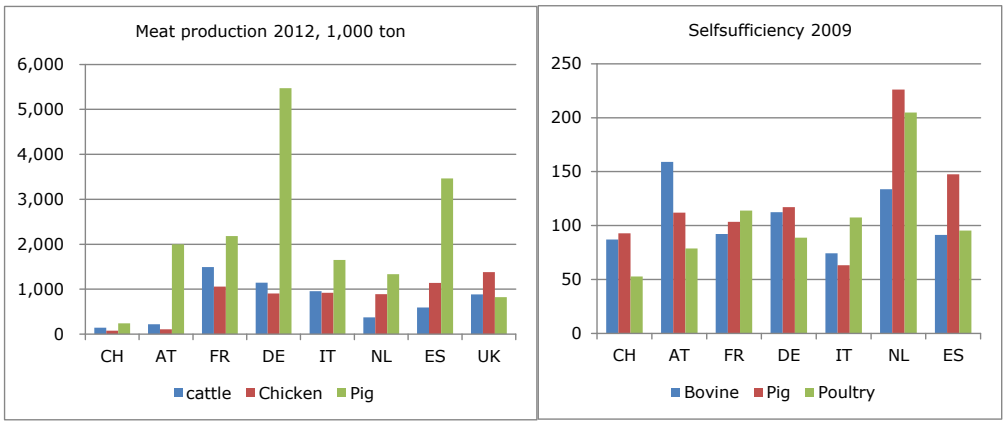


Legend:
- O Overall competitiveness
- S Annual growth share turnover in manufacture industry 2001-2011
- T Difference in RTA indicator 2012 minus value 2000
- M Difference world market share 2011 minus 2000
- L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
- P Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

In the period 1991-2012, the annual Swiss cattle and pig meat production declined, respectively -0.9 and -0.4%. The production of chicken meat grew 4.2% annually, which was the highest growth level after Germany (5%).The Swiss self-sufficiency for all meat products remained below 100%.

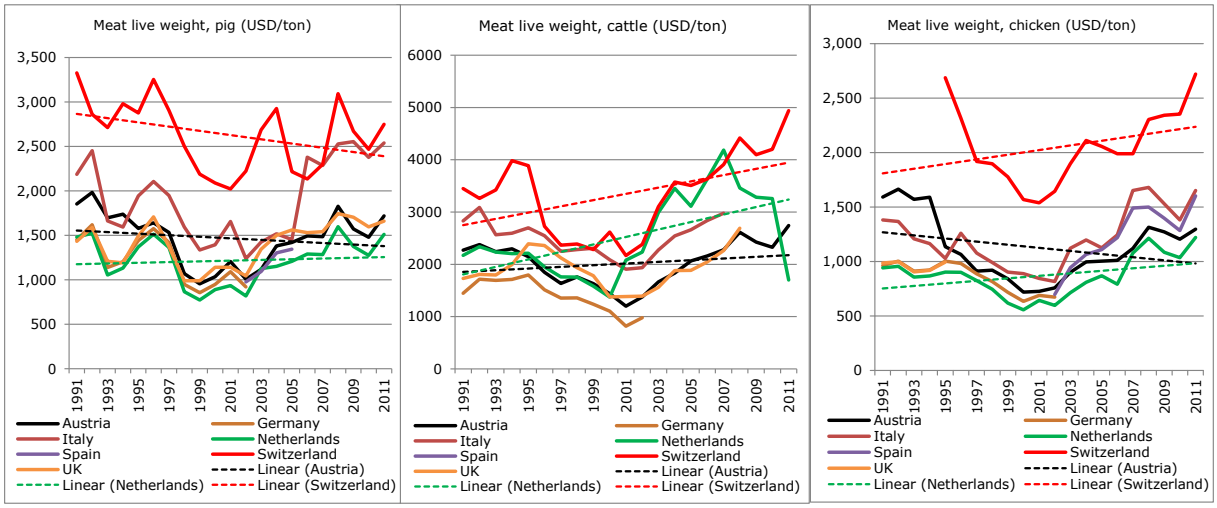
Figure A2.2. Meat production and self-sufficiency



Source: LEI calculation based on FAOstat.

The Swiss farmers' meat prices for all categories are above the levels of all other selected countries. The trend for pig meat is converging to the other levels. In contrast, the prices differences for the cattle and chicken are increasing between Switzerland and the benchmark countries.

Figure A2.3. Farmers' prices for meat from 1991 to 2011



Source: Based on FAOstat.

The meat industry in Switzerland is the smallest of all selected countries; however, the average turnover per enterprise is far above that of most other countries. The average turnover decreased, whereas most other countries showed a growth. The number of employees did not decline in the same pace as the decline in the turnover.

Table A2.1. Structure of the meat industry in 2011

Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1,000	Growth[a] (%)
Switzerland[a]	4.1	1.3	257	1.5	16.0	-0.1	11.9	-0.1
Austria	3.7	3.9	986	-1.6	3.8	5.6	16.9	-0.2
Germany	44.1	4.2	11 295	-2.6	3.9	7.0	202.1	-0.4
Spain	20.9	3.7	4 062	-0.7	5.1	4.4	83.3	1.4
France	34.9	0.0	6 540	-5.9	5.3	6.2	127.9	-3.0
Italy	19.8	1.6	3 601	-0.3	5.5	2.0	59.3	0.5
Netherlands	9.2	0.6	519	-4.5	17.8	5.4	13.9	-6.6
United Kingdom	16.9	-1.3	1 024	-1.2	16.5	0.0	74.5	-4.7

[a] Annual growth rate from 2001 to 2011. Swiss labour data for 2008; growth rate for 2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

Processing and preserving of fruit and vegetables

This subsector (NACE code C103) has a share of 1.7% in the total food & beverage processing industry's turnover.

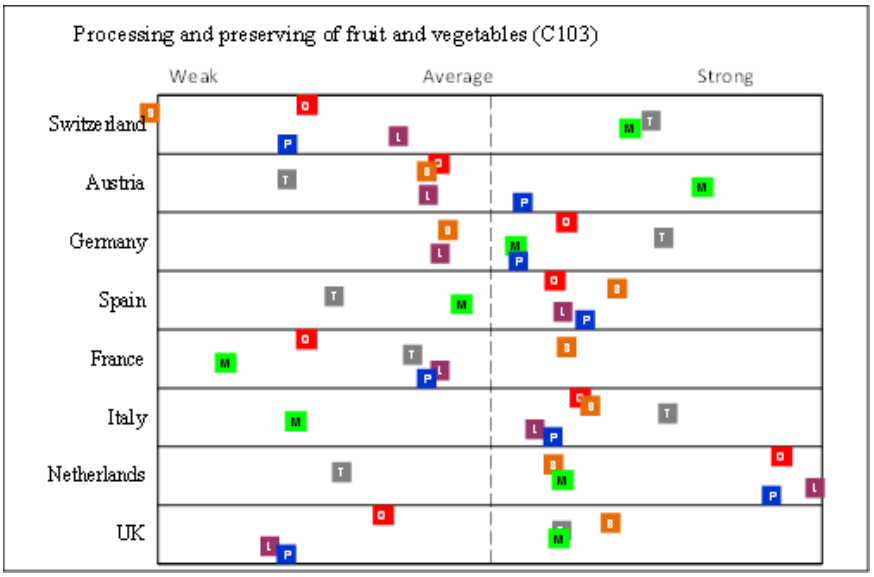
The overall competitiveness (O) of the Swiss fruit and vegetable processing industry is together with France the weakest of the selected countries. The main developments indicate that:

- The share of the turnover of the fruit and vegetable processing industry in total manufacture (S) is the weakest. Switzerland had a significant decline in the share.
- The growth of the real turnover (P) of the fruit and vegetable processing industry is below average and on the same level as the UK.
- The growth of the labour productivity (real turnover per employee (L)) is also weak (UK is the weakest) compared to all benchmark countries.
- The Swiss Relative Trade Advantage (T) index is among the strongest of all selected countries. Switzerland remained a net importer of fruit and vegetable products.
- The performance of the export share on the world market (M) of Switzerland is strong and after Austria the highest. However, the export growth of all selected countries is below *world market* average, resulting in declining markets shares. Austria showed the lowest decline.

In addition, the following observations are made:

- The Swiss apple price is rather high and rising and the production decline is moderate. The Swiss potato price is also rather high but stable and the production is strongly declining. Little data have been found on the processing of single fruit or vegetable products.
- The total turnover has a small share (2%) in the total food industry, strongly declining and small compared to all benchmark countries.
- FAOstat indicates that only other fruits and grapes are processed in Switzerland. Grapes are processed for wine production. In 2012 apples (USD 331 million), potatoes (USD 260 million), lettuce & chicory (USD 202 million), onions & shallots (USD 194 million) and tomatoes (USD 102 million) had a production value of above USD 100 million according to FAOstat. Switzerland is more than self-sufficient in apples, a net-importer of potatoes with a self-sufficiency between 60 and 90 in the period 1991 to 2009 and for tomatoes heavily dependent on imports (self-sufficiency below 20%). For other products, no data or insufficient data are available in the FAOstat database.
- Apples and potatoes will be discussed, as these have the highest production value and are single commodities. The apple production in Switzerland declined as in most selected countries. However, in the neighbouring countries, Austria and Italy the production grew in the period 1991 to 2011. The price of apples is rising since 2000 and the highest after the prices in the United Kingdom. The price difference with Italy, the largest producer of the selected countries, increased.

Figure A2.4. Competitiveness of the fruit and vegetable manufacturing industry



Legend:
- O Overall competitiveness
- S Annual growth share turnover in manufacture industry 2001-2011
- T Difference in RTA indicator 2012 minus value 2000
- M Difference world market share 2011 minus 2000
- L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
- P Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

Also, the potato production declined, as in most selected countries. The price development is slightly positive; the price growth in Germany, the largest producer of the selected countries, is higher. Italy has the highest price since 2001 and over the period 1991-2011 the highest growth rate.

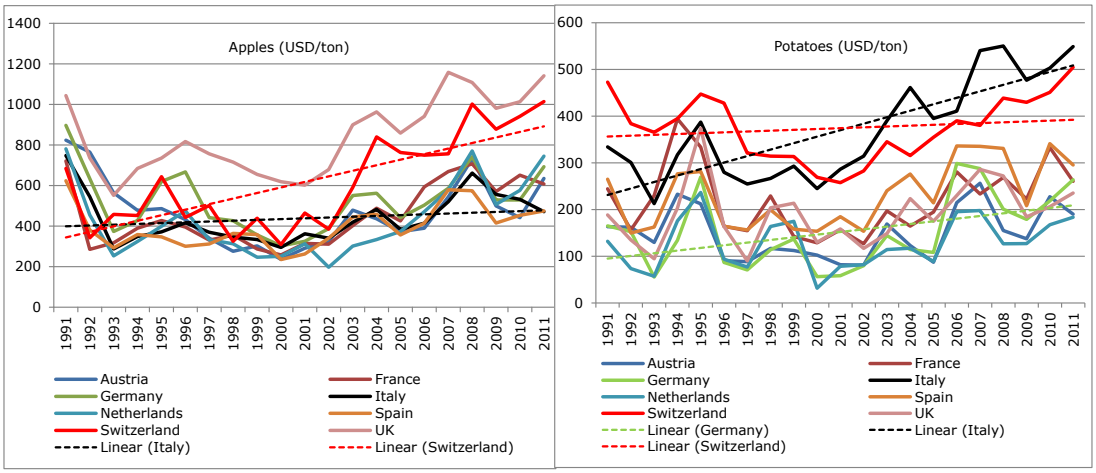
Concluding: the Swiss apple price is rather high and rising and the production decline is moderate. The Swiss potato price is also rather high but stable and the production is strongly declining.

Table A2.2. Production of apples and potatoes in the period 1991-2011

	Apples (1 000 tonnes)				Potatoes (1 000 tonnes)			
	2011	average	Stdev	(%)	2011	average	Stdev	Growth (%)
Switzerland	327	273	74	-0.7	515	578	135	-2.9
Austria	547	434	79	3.0	816	710	73	-0.5
France	1 857	2 216	330	-1.6	7 440	6 489	564	1.0
Germany	898	1 100	537	-0.5	11 800	11 606	1 046	-0.1
Italy	2 411	2 171	153	0.5	1 547	1 916	235	-1.9
Netherlands	418	446	105	-1.5	7 333	7 199	712	-0.3
Spain	670	782	146	-1.6	2 455	3 207	844	-3.7
UK	234	243	64	-2.5	6 115	6 502	553	-0.8

Source: Based on FAOstat

Figure A2.5. Prices of apples and potatoes



Source: Based on FAOstat.

All structure indicators show a negative trend for Switzerland, indicating the fruit and vegetable processing industry is weak.

Table A2.3. Structure of the fruit and vegetable processing industry in 2011

Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1,000	Growth[a] (%)
Switzerland[a]	0.7	-2.1	67	0.8	11.0	-2.9	2.2	-5.4
Austria	1.4	3.3	118	-1.5	11.5	4.9	3.5	0.6
Germany	9.7	2.4	654	0.2	14.8	2.2	31.8	0.3
Spain	7.8	4.9	1,247	5.3	6.3	-0.4	31.5	0.2
France	7.7	1.5	1,176	0.3	6.6	1.2	25.2	-0.6
Italy	9.8	3.8	1,788	-1.0	5.5	4.9	29.8	0.0
Netherlands	5.0	4.6	149	1.0	33.6	3.6	9.4	-0.2
United Kingdom	6.9	0.9	488	-1.0	14.2	2.0	33.2	-0.6

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

Manufacture of vegetable and animal oils and fats

This group includes the manufacture of crude and refined oils and fats from vegetable or animal materials, except rendering or refining of lard and other edible animal fats (NACE code C104, EC, 2008).This subsector has a share of 1.0% in the total food & beverage processing industry's turnover.

The overall competitiveness (O) of the Swiss oils and fats processing industry (C104) is above average and on the same level as France and the Netherlands. The main developments indicate that:

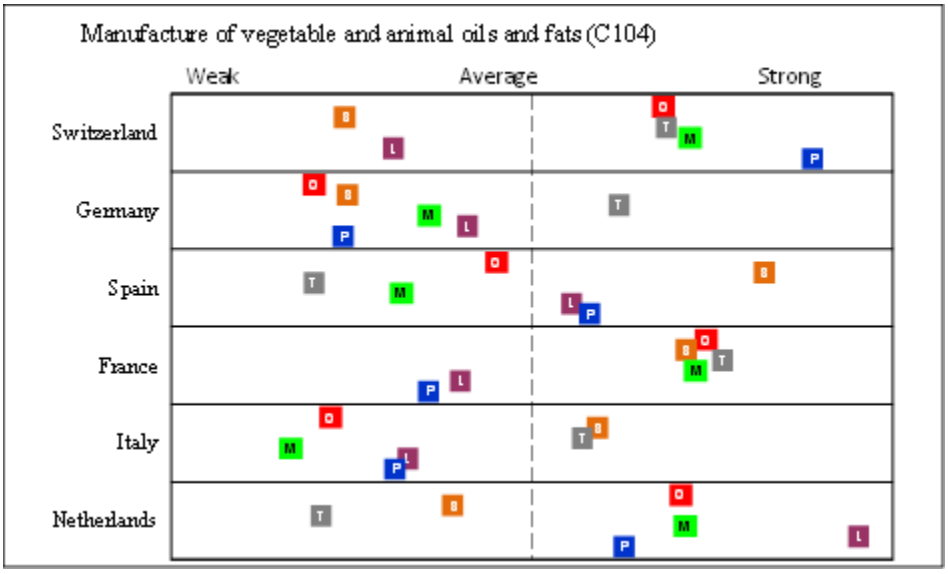
- The growth of the share of the turnover of the oils and fats processing industry in total manufacture (S) is below average and together with the German industry the weakest.
- The growth of the real turnover (P) is the strongest.

- The growth of the labour productivity (real turnover per employee (L)) is also the weakest compared to all benchmark countries.
- The Swiss Relative Trade Advantage (T) index is among the highest of all selected countries. Switzerland remained a net importer of oils and fats products.
- The performance of the export share on the world market (M) of Switzerland is strong and on the same level as France and the Netherlands. However, the Swiss market share of 0.1% is very small. Most countries have a market share below 1%, except Spain and the Netherlands, which have more than 2% market share.

In addition, the following observations are made:

- The Swiss oils and fats manufacturing is very small: a turnover of EUR0.4bn, just 1% of the total turnover of the food industry (C10)
- Switzerland produces little oilseeds, mainly rapeseed. The production is around 3% of the levels of France, Germany or the UK. The price is above the level of EU countries, despite a strong decline in the nineties
- The turnover is small compared to most other benchmark countries but also as share (1%) in the total food industry. The turnover increased strongly over last decade.

Figure A2.6. Competitiveness of the oils and fats manufacturing[a]



Legend:
- O Overall competitiveness
- S Annual growth share turnover in manufacture industry 2001-2011
- T Difference in RTA indicator 2012 minus value 2000
- M Difference world market share 2011 minus 2000
- L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
- P Annual growth rate real turnover value (2001-2011)

[a] Austria and the UK are not included, due to insufficient information on the economic indicators.

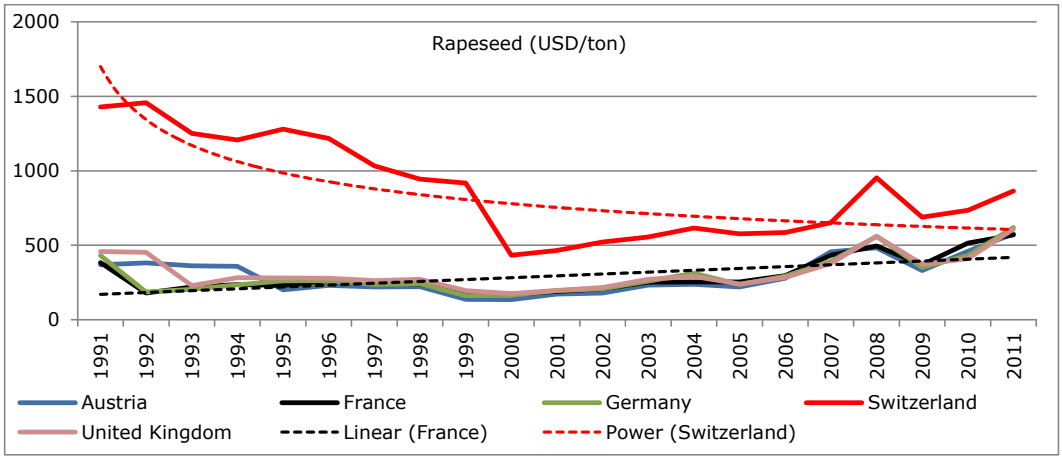
Source: LEI calculations based on Eurostat and FBS.

Switzerland is a small producer of oil seeds. The farmers' production value of rapeseed was on average USD 53 million, around 74 000 tonnes in 2012, and increased slightly since 2000. Compared to France (5 400 000 tonnes in 2012), Germany (3 900 000 tonnes) or the UK (2 700 000 tonnes), Switzerland is a small producer. Other oil crops have even produced in lower quantities; the farmers' value of sunflowers is second with USD 9 million. The self-sufficiency for rape and mustard seeds is during the period 2002 to 2009 around 80%.

Little information on the oil supply balance has been found in the FAO statistics. Information on animal fats for edible oil is fully lacking.

The price of rapeseed in Switzerland is above selected countries with a large production. In the period 1991 to 2000, the Swiss was substantial above the price of EU countries but the price declined and converged to the EU prices. Since 2000 the Swiss price follows the EU countries' prices but is still above.

Figure A2.7. Price of rapeseed



Source: LEI calculation based on FAOstat.

The turnover of the Swiss oils and fats manufacturing grew strongly, the industry is small with 17 enterprises and a total turnover of EUR 400 million. The average turnover per enterprise is in the range of those of Germany, France and the UK. In addition, it is above the level of Spain that has the highest total turnover of all selected countries.

Table A2.4. Structure of oils and fats manufacturing in 2011

Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1 000	Growth[a] (%)
Switzerland[a]	0.4	6.0	21	7.6	21.0	-1.5	0.4	3.4
Austria	0.5		73	6.7	7.1		0.7	
Germany	6.0	1.1	163	13.0	36.7	-10.5	4.9	-3.1
Spain	10.1	5.6	1,510	-1.1	6.7	6.8	13.1	-0.7
France	4.1	2.5	213	1.3	19.4	1.2	3.0	-1.9
Italy	5.9	2.7	3,344	-2.4	1.8	5.2	10.7	-1.9
Netherlands	7.0	2.8	38	9.7	183.7	-6.3	2.7	-2.5
United Kingdom	1.3	-8.7	50	-2.7	25.6	-6.1		

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.
Source: Eurostat for EU countries and BFS for Switzerland.

Manufacture of dairy products

This subsector (NACE code C105) has a share of round 12% in the total food & beverage processing industry's turnover and is the second largest subsector after "other foods".

The overall competitiveness (O) of the Swiss dairy processing industry is weak compared to the benchmark countries. The main developments indicate that:

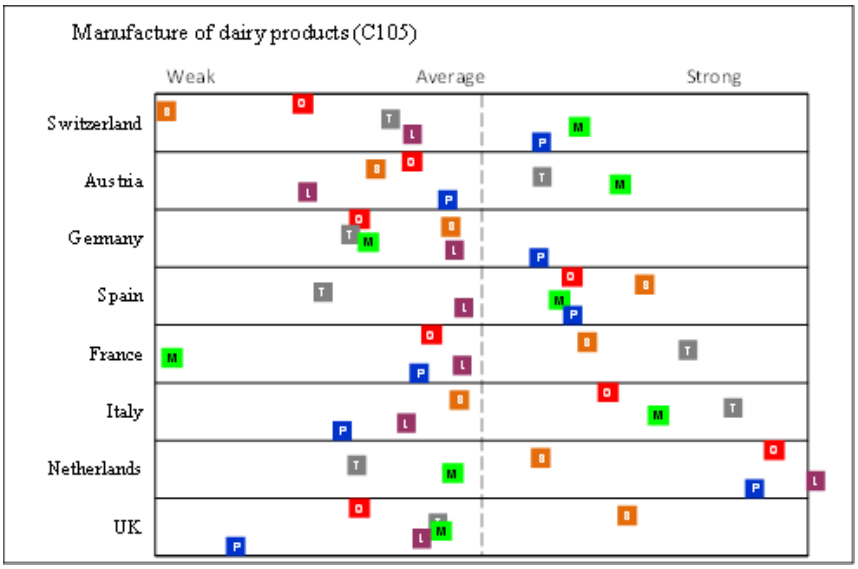
- The share of the turnover of the dairy industry in total manufacture (S) declined strongly and Switzerland is the weakest on this indicator.
- The growth of the real turnover (P) of the dairy industry is above average.
- The growth of the labour productivity (real turnover per employee (L)) is weak, especially compared to the Netherlands, but slightly better than in Austria.
- The Relative Trade Advantage (T) index of Switzerland declined, Switzerland below average and relatively weak. Nevertheless, Switzerland remained a net exporter of dairy products.
- The growth of the export share on the world market (M) of Switzerland is above average: the decline was less than the leading EU exporters France, Germany and the Netherlands.
- In addition, the following observations are made:
- The raw material base for the Swiss dairy industry did not change significantly during the period 1990 to 2009. The self-sufficiency increased modestly.
- The farmers' prices in Switzerland are above those of the EU countries. The prices are converging: the price trend in Switzerland is negative and positive in Germany – the largest milk producer of the selected countries.
- The Swiss average turnover per enterprise is one of the lowest, together with Italy and Spain. The Dutch and German enterprises have an average turnover that is 5 to 8 times more than the Swiss.

Milk production in Switzerland and benchmark countries was rather stable during the period from 1991 to 2009: a small standard deviation. Nevertheless a small growth for some countries including Switzerland can be observed and a decline in the milk production for some others. The self-sufficiency in Switzerland was increasing, but slowly. Countries like Austria and the Netherlands showed a strong growth, whereas Spain and the United Kingdom showed a decline. Based on these developments it is concluded that the raw material base in for the Swiss dairy industry did not change significantly.

The farmers' prices in Switzerland are above those of the selected EU countries. The prices are converging: in the early nineties, the Swiss producer price was around 1.9 times the German price and in 2011, around 1.5 times. German is the largest milk producer of the selected EU countries. Nevertheless, a considerable difference in farmers' prices of milk can be observed. Within the European Union, the farmers' prices in Italy – the highest in the European Union – are 40% higher than in the United Kingdom – the lowest prices – from 2009 to 2011.

The Swiss growth rate of the average turnover is among the lowest of the selected countries, all though the number of dairy processing firms declined strongly in Switzerland, stronger than in Italy, Spain or United Kingdom. The other countries show even a growth in the number of firms. This decline in firms and in turnover resulted in a rather strong growth of scale of firms: 4% growth of the average turnover per enterprise.

Figure A2.8. Competitiveness of the dairy industry



Legend:
- O Overall competitiveness
- S Annual growth share turnover in manufacture industry 2001-2011
- T Difference in RTA indicator 2012 minus value 2000
- M Difference world market share 2011 minus 2000
- L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
- P Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

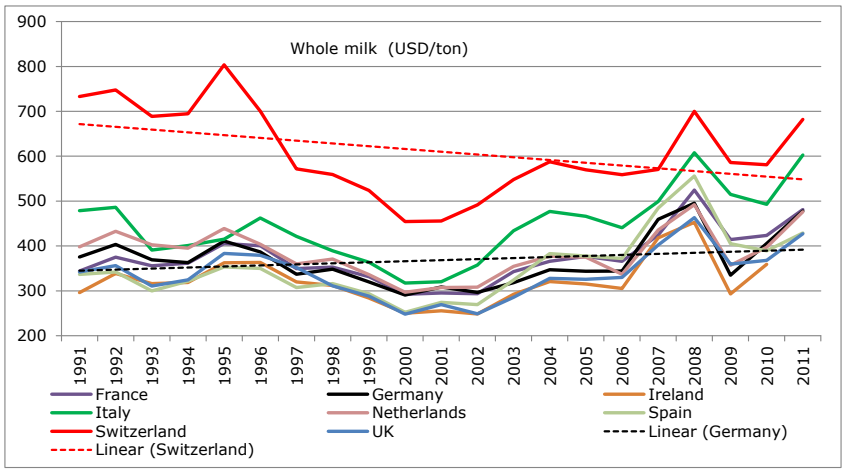
Table A2.5. Production and self-sufficiency of milk

Country	Production (million tonnes)				Self-sufficiency[a] (%)			
	2009	1991-2009			2009	1991-2009		
		Mean	Stdev	growth		Mean	Stdev	growth
Switzerland	4.1	3.9	0.1	0.2	117.3	113.3	2.8	0.2
Austria	3.3	3.2	0.1	-0.1	136.5	118.9	10.1	1.2
France	24.2	25.7	0.6	-0.6	127.6	124.0	3.8	0.4
Germany	29.2	28.4	0.4	0.0	121.3	122.0	5.5	-0.1
Italy	11.4	12.2	0.6	-0.3	68.8	69.4	1.9	0.1
Netherlands	11.5	11.1	0.3	0.2	163.3	135.1	12.7	0.9
Spain	7.4	7.1	0.3	0.1	70.2	80.3	6.0	-1.2
United Kingdom	13.2	14.6	0.5	-0.6	77.8	91.1	5.9	-1.1

[a] Self-sufficiency is the domestic supply (=supply for domestic use, FAO: faostat.fao.org/site/379/DesktopDefault.aspx?PageID=379) as percentage of the production.

Source: based on FAOStat commodity balances: FAO item code 2848 “Milk - Excluding Butter”.

Figure A2.9. Farmers' prices of milk from 1991 to 2011



Source: Calculation based on FAOStat.

Table A2.6. Structure of the dairy industry in 2011

Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1 000	Growth[a] (%)
Switzerland[a]	4.9	0.8	768	-4.0	6.4	5.0	8.2	-2.2
Austria	2.4	2.1	157	3.3	15.5	-1.2	4.9	0.8
Germany	27.5	2.1	472	3.9	58.2	-1.7	40.1	0.1
Spain	10.6	4.0	1 445	-0.3	7.3	4.3	26.8	0.5
France	27.2	0.9	1 958	2.7	13.9	-1.7	57.2	-1.2
Italy	18.1	0.5	3 382	-1.2	5.4	1.7	44.1	-1.8
Netherlands	10.5	3.4	304	2.6	34.7	0.8	12.4	-0.5
United Kingdom	9.9	-0.1	573	-0.5	17.3	0.4	26.4	-3.5

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

Manufacturing of grain mill products and starch products

This group includes the milling of flour or meal from grains or vegetables, the milling, cleaning and polishing of rice, as well as the manufacture of flour mixes or doughs from these products (EC, 2008). This subsector (NACE code C106) has a share of 1.4% in the total food & beverage processing industry's turnover and is a rather small subsector.

The overall competitiveness (O) of the Swiss grain mill and starches industry (C106) is weak similar to several benchmark countries. Austria is the strongest and also the UK is above average. The main developments indicate that:

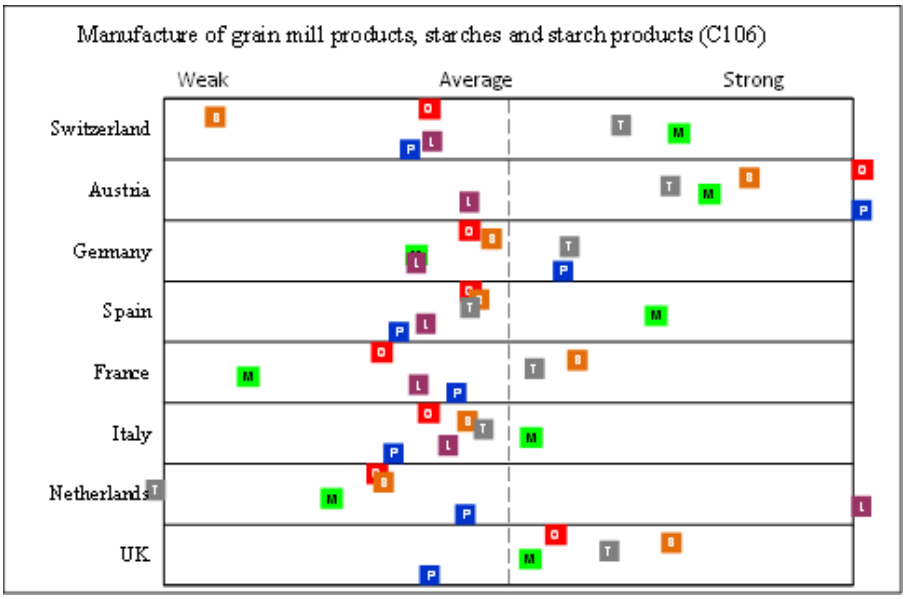
- The share of the turnover of the industry in total manufacture (S) in Switzerland is weak: the country showed a major decline compared to the benchmark countries.
- The growth of the real turnover (P) of the grain mill and starches industry is below average as in most benchmark countries. Austria performed extremely well.
- The growth of the labour productivity (real turnover per employee (L)) is also weak as in most benchmark countries. The Netherlands performed extremely well.

- The Relative Trade Advantage (T) index of Switzerland is above average, the Dutch performed the weakest. Nevertheless, Switzerland remained a net exporter of grain mill and starches products.
- The performance of the export share on the world market (M) of Switzerland is above average: the decline was lower than the leading EU exporters France, Germany, Italy and the United Kingdom.

In addition, the following observations are made:

- The raw material base for the Swiss grain mail and starches industry is mainly wheat. The self-sufficiency declined modestly. The prices declined in the nineties and are nowadays still above the EU level. The 2008 peak in Switzerland was mitigated.
- The Swiss average turnover per enterprise is amongst the lowest comparable as in selected southern European countries

Figure A2.10. Competitiveness of the grain mill and starches industry[a]



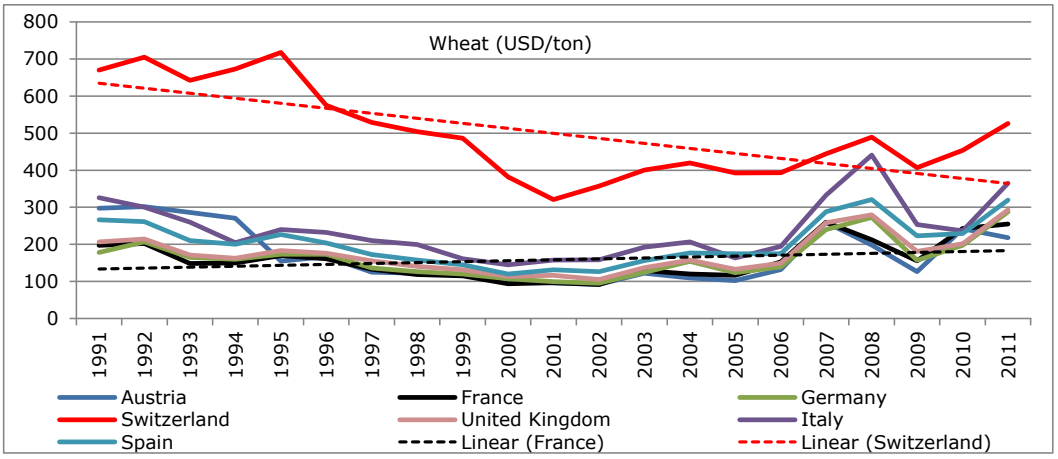
Legend: O Overall competitiveness
S Annual growth share turnover in manufacture industry 2001-2011
T Difference in RTA indicator 2012 minus value 2000
M Difference world market share 2011 minus 2000
L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
P Annual growth rate real turnover value (2001-2011)
[a] UK had insufficient data to calculate the labour productivity.

Source: LEI calculations based on Eurostat and FBS.

Switzerland is a small producer of cereals. The farmers' production value of wheat in 2011 was USD 291 million and has been declining since 1991. The producer values of barley (USD 67 million in 2011), maize (53) or Triticale (22) are far below these levels. Compared to France (36 million tonnes in 2012), Germany (23 million tonnes) or the United Kingdom (15 million tonnes), Switzerland (0.6 million tonnes) is a small wheat producer. Furthermore, the Swiss production quantity declined slightly. The self-sufficiency for wheat declined from 60 to 70% in nineties to 50 % in 2012.

The Swiss wheat prices are above the level of the EU countries. The prices declined in the nineties and showed a similar pattern as the EU prices. However, the peak in 2008 was mitigated: less price increase compared to the EU countries.

Figure A2.11. Wheat prices (USD/tonnes)



Source: Based on FAOstat.

The total turnover is small as share (1.4%) in the total food industry and small compared to all benchmark countries. Furthermore, the Swiss turnover grew the least. Due to a decline in the number of enterprises, the turnover per enterprise grew. Nevertheless, the turnover per enterprise is amongst the lowest comparable with the levels in selected southern European countries: the average turnover in the United Kingdom is nine times the Swiss level.

Table A2.7. Structure of the grain mill and starches industry in 2011

Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1,000	Growth[a] (%)
Switzerland[a]	0.6	0.6	89	-3.0	7.1	3.8	1.3	-3.9
Austria	1.0	14.1	129	0.6	7.4	13.4	2.3	7.5
Germany	6.7	5.0	623	2.5	10.7	2.5	15.9	2.0
Spain	3.4	3.1	532	-4.6	6.4	8.1	6.4	-1.6
France	7.2	3.2	512	-2.8	14.0	6.2	14.5	0.1
Italy	6.9	2.3	1 067	-5.6	6.5	8.4	8.9	-2.7
Netherlands	2.2	1.5	113	4.2	19.3	-2.6	3.5	-14.4
United Kingdom	7.6	4.3	120	-1.9	63.7	6.4		

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

Manufacture of bakery and farinaceous products

This sub-industry includes the production of bakery products, macaroni, noodles and similar products(EC, 2008). This subsector (NACE code C107) has a share of 5% in the total food & beverage processing industry's turnover and is a medium sized subsector.

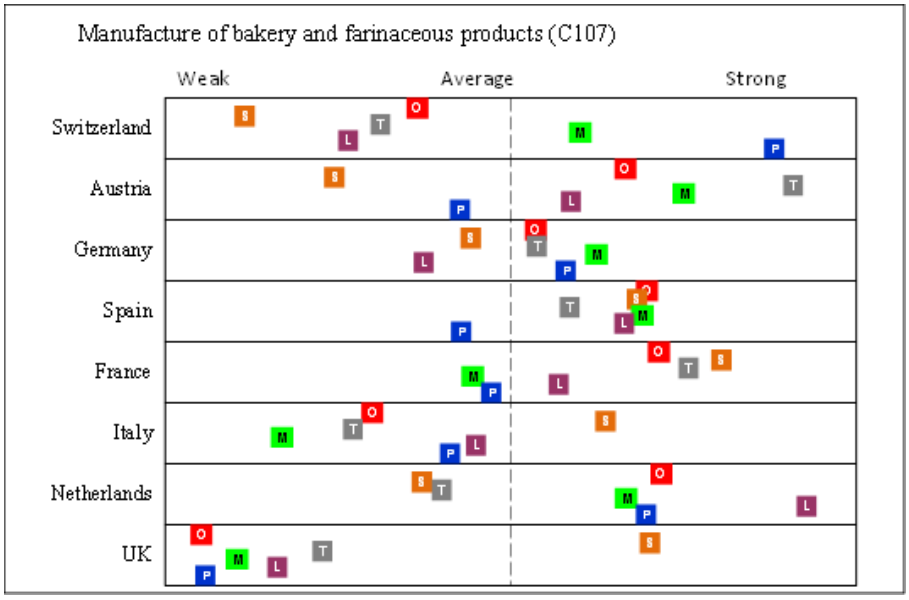
The overall competitiveness (O) of the Swiss grain bakery industry (C107) is weak. The main developments indicate that:

- The share of the turnover of the industry in total manufacture (S) declined in Switzerland: Switzerland is the weakest on this indicator.
- The growth of the real turnover (P) of the bakery industry is the highest of all benchmark countries.
- The growth of the labour productivity (real turnover per employee (L)) is also weak and after the United Kingdom the lowest. However, the Swiss real turnover per employee is together with the Dutch the highest.
- The Relative Trade Advantage (T) index of Switzerland is below average. Austria performed strong. Switzerland is very small net-importer of bakery products.
- The performance of the export share on the world market (M) of Switzerland is above average: the growth was above world market average.

In addition, the following observations are made:

- The growth of the turnover of the bakery industry is higher than all other selected countries.
- The average turnover per enterprises is the highest of all countries and far above that of most countries.
- The share (37%) of enterprises with less than nine employees is the lowest of all countries: in France the highest 95%.

Figure A2.12. Competitiveness of the bakery products industry



Legend:

O	Overall competitiveness
S	Annual growth share turnover in manufacture industry 2001-2011
T	Difference in RTA indicator 2012 minus value 2000
M	Difference world market share 2011 minus 2000
L	Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
P	Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

The Swiss based raw material source is wheat, which is discussed already above. The growth of the turnover of the bakery industry is higher than all other selected countries. Also, the average turnover per enterprise is the highest of all countries and far above that of most countries.

Table A2.8. Structure of the bakery products industry in 2011

Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1,000	Growth[a] (%)
Switzerland[a]	2.1	4.5	219	-0.3	9.7	4.7	14.6	2.4
Austria	2.4	2.3	1 773	-2.3	1.3	4.8	30.7	-0.6
Germany	23.3	2.6	14 766	-0.8	1.6	3.5	396.8	2.0
Spain	7.3	2.9	10 429	-2.4	0.7	5.4	79.6	-1.3
France	21.2	2.1	41 552	-0.7	0.5	2.9	222.8	0.0
Italy	16.9	2.1	35 664	-2.0	0.5	4.2	173.8	0.0
Netherlands	4.5	2.0	2 348	-2.5	1.9	4.7	43.3	-1.2
United Kingdom	11.3	-0.6	2 218	0.0	5.1	-0.7	108.5	-1.2

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate 2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

Manufacture of prepared animal feeds

This sector (NACE Code C109) includes 1) manufacture of prepared feeds for farm animals, including concentrated animal feed and feed supplements; 2) preparation of unmixed (single) feeds for farm animals; and 3) manufacture of prepared feeds for pets, including dogs, cats, birds, fish etc.(EC, 2008). This subsector has a share of 3.1% in the total food & beverage processing industry's turnover.

The overall competitiveness (O) of the Swiss animal feed processing industry is weak compared to the benchmark countries. This position is linked to the position of dairy and meat products; the main buyers from the animal feed industry. The developments indicate that:

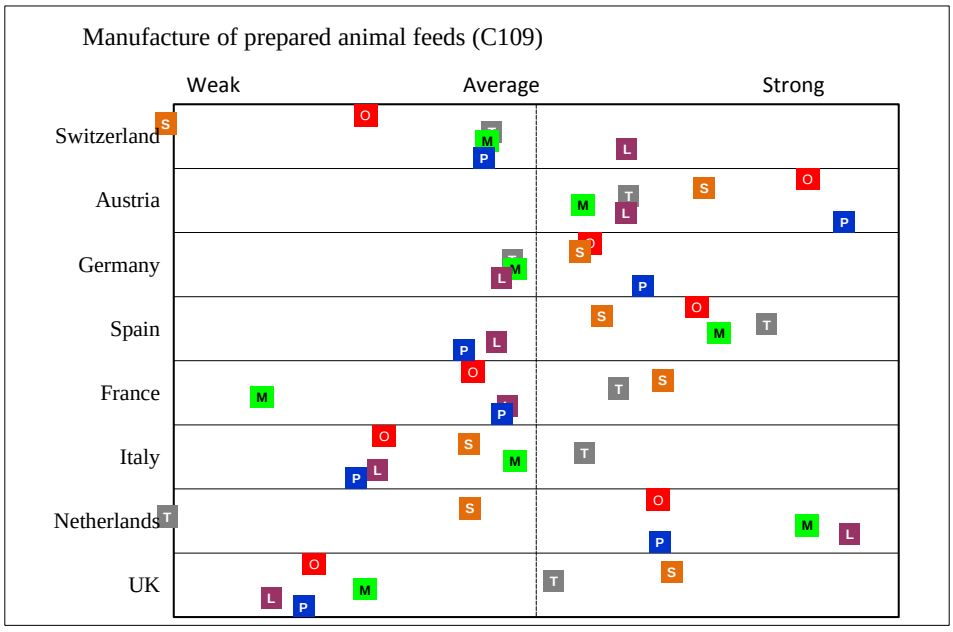
- The share of the turnover of the animal feed products industry in total manufacture (S) is very weak and declined considerable. The shares grew in all other countries.
- The growth of the real turnover (P) of the animal feed industry is below average.
- The growth of the labour productivity (real turnover per employee (L)) is above average, just like in Austria, below the Dutch level.
- The Relative Trade Advantage (T) index of Switzerland is also below average. The Netherlands is the weakest despite the above average export growth. The imports grew even faster.
- The performance of the export share on the world market (M) of Switzerland is also below average. The Dutch showed the best performance, with the highest increase.

In addition, the following observations are made:

- Only the turnover of the Swiss animal feed industry declined, the industry in all other countries showed a growth. The average turnover per enterprise is low but comparable with the German and Italian.

- The imports of oil cakes – a basic ingredient for concentrated feed – increased strongly. Cat and dog feed takes an important share in the imports (40%) and in the exports (75%)

Figure A2.13. Competitiveness of the animal feed industry



Legend: O Overall competitiveness
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M Difference world market share 2011 minus 2000
L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
P Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

The animal feed industry is for their raw materials not directly linked to the primary industry. Important sources of raw materials are cakes from oilseeds, processed by the oils and fats manufacturing. As shown above that is a relatively small industry. The total turnover of the oils and fats industry (EUR 0.4m) is just one third of that of the animal feed industry (EUR 1.3million). Furthermore, the feed industry is a supplier to the livestock husbandry.

The average turnover per enterprise is low but comparable with almost that in the other countries. Austria has an average turnover per enterprise that is 2.5 times higher than Switzerland and the highest level of all selected countries.

Table A2.9. Structure of the animal feed products industry in 2011

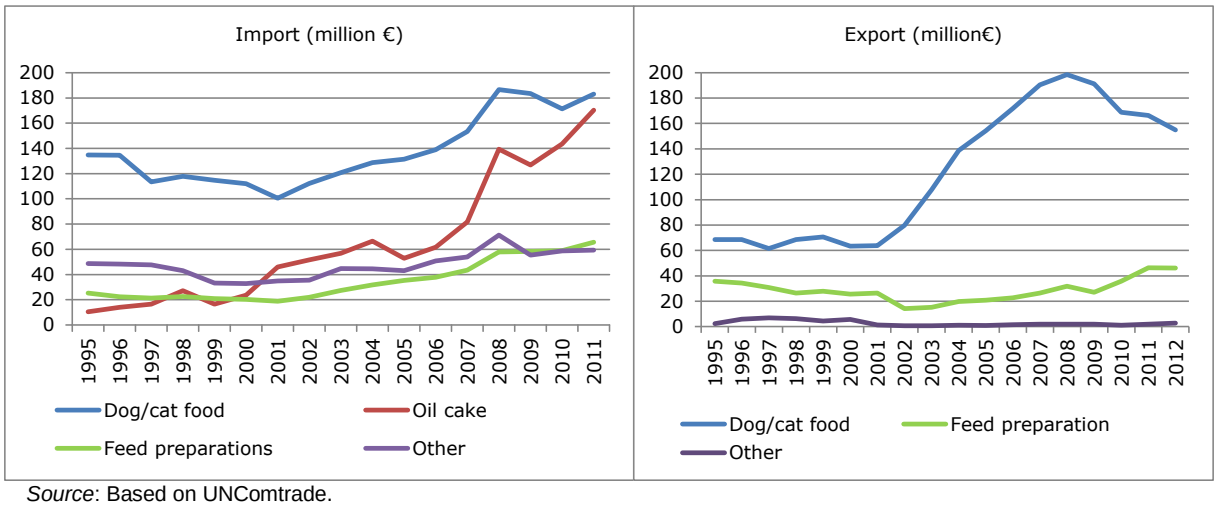
Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1 000	Growth[a] (%)
Switzerland[a]	1.3	1.5	142	-2.8	8.9	4.4	1.9	-4.4
Austria	1.0	9.3	56	-1.3	17.4	10.7	2.0	3.5
Germany	10.2	4.9	563	2.6	18.0	2.3	16.2	1.3
Spain	10.2	3.9	809	-1.4	12.7	5.4	13.4	-1.0
France	12.3	3.2	441	-2.4	28.0	5.8	18.3	-0.6
Italy	5.5	1.4	523	-1.5	10.5	2.9	7.7	-1.4
Netherlands	7.6	3.3	174	-1.9	43.5	5.3	7.4	-2.1
United Kingdom	7.9	1.6	396	-3.6	20.0	5.4	14.8	-1.1

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

Swiss imports of oil cake and feed preparations - basic ingredients for feed concentrates - increased strongly last decade. Trade in dog and cat feed is remarkable: imports and imports take a significant share in imports (39%) and even more in the exports (76%) in 2012.

Figure A2.14. Animal feed trade



Source: Based on UNComtrade.

Manufacture of beverages

This sector includes the manufacture of beverages, such as non-alcoholic beverages and mineral water, manufacture of alcoholic beverages mainly through fermentation, beer and wine, and the manufacture of distilled alcoholic beverages. Excluded are production of fruit and vegetable juices (NACE C103), of milk-based drinks (NACE C105) and of coffee, tea and mate products (NACE C108).(EC, 2008) The subsector beverages has a share of 7.7% in the total food & beverage processing industry's turnover and ranks on position 4 in total turnover.

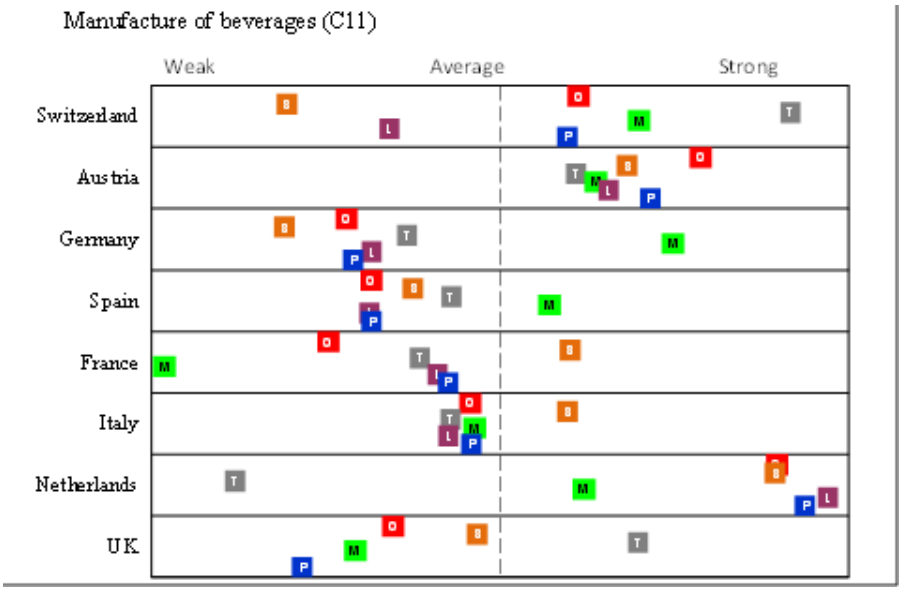
The overall competitiveness (O) of the Swiss beverages manufacturing industry (C11) is above average compared to the benchmark countries. The Austrian and Dutch industry is slightly stronger. The main developments indicate that:

- The share of the turnover of the beverages industry in total manufacture (S) is weak and declined in Switzerland.
- The growth of the real turnover (P) of the beverages manufacturing is above average: the Netherlands and Austria outperform Switzerland.
- The growth of the labour productivity (real turnover per employee (L)) is below average.
- The Relative Trade Advantage (T) index of Switzerland outperforms all other countries. Nevertheless, Switzerland is a small net importer of beverages.
- In addition, the performance of the export share on the world market (M) of Switzerland is the strongest after Germany. Their export grew twice as fast as the world average.

In addition, the following observations are:

- The sub-industries of beverages manufacturing are soft drinks and bottled water (40-45% of total turnover), producing beer (32-34%) and grape wine making (12-15%). The shares remained rather stable during the period 2001-2011.
- The production of grapes is small and stable. The farmers' prices of grapes are relatively high: at least two times the EU level.

Figure A2.15. Competitiveness of the beverages manufacturing



Legend:
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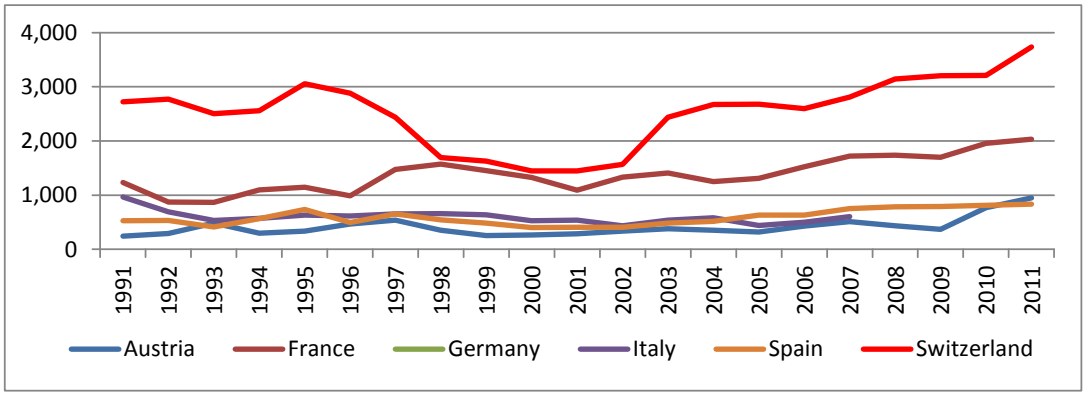
L Annual growth rate labour productivity (real turnover/employee) (2001-2011); CH (2001-2008)
P Annual growth rate real turnover value (2001-2011)

Source: LEI calculations based on Eurostat and FBS.

The FAO statistics showed that processing of grapes is around the amount of domestic produced grapes: since 2000 slightly above 100%. Imported grapes are mainly for fresh consumption or "processed" into ready-to-eat fruit salads. Wine-grapes are generally not transported over long distances. The raw material base for wine is thus mainly domestically. The production is rather stable in the period 1991 to 2011. The production of 130 000 tonnes of grapes is negligible compared to the 6 million tonnes in France, Italy or Spain. Austria produces twice as Switzerland. The prices of Swiss grapes are high compared to the EU benchmark countries. For beer cereals are needed, those developments are discussed in the previous section on grain mill products (C106).

Figure A2.16. Prices of grapes in USD/tonne



Source: Based on FAOstat.

The Swiss beverages manufacturing turnover showed a modest growth (3%), higher than Germany and the UK (both -0.4%), lower than Austria and the Netherlands (10-12%). The average turnover is in the range of the Southern European countries, but around 60% below of the non-wine-producing Northern European benchmark countries.

Table A2.10. Structure of beverage manufacturing in 2011 (Switzerland 2008)

Country	Turnover		Enterprises		Average turnover per enterprise		Employees[a]	
	Billion (EUR)	Growth[a] (%)	Number	Growth[a] (%)	Million (EUR)	Growth[a] (%)	1 000	Growth[a] (%)
Switzerland[a]	3.2	4.5	367	1.6	8.6	2.8	7.1	2.1
Austria	4.9	9.7	365	3.2	13.4	6.3	9.0	-0.2
Germany	20.1	-0.4	2 019	0.1	10.0	-0.6	70.5	-1.2
Spain	15.8	1.6	4 557	0.2	3.5	1.4	47.8	-0.5
France	25.1	3.0	2 959	-1.7	8.5	4.7	44.1	-0.5
Italy	19.0	4.5	2 871	-0.4	6.6	4.9	35.9	-0.2
Netherlands	4.7	12.1	189	6.6	25.1	5.2	7.0	-3.0
United Kingdom	21.3	-0.4	1 033	3.3	20.6	-3.6		

[a] Annual growth rate from 2001 to 2011. Swiss labour data are for 2008 and growth rate 2001-2008.

Source: Eurostat for EU countries and BFS for Switzerland.

The beverages manufacturing (NACE C110) is rather diverse and is subdivided into 5 sub-industries. Almost half of the turnover comes from manufacturing soft drinks and bottled waters. Second is beer production (34% of the turnover) and third wine production from grapes (15%). The latter sub-industry accounts for almost half of the enterprises and are - most probably- in majority winegrowers, who produce wine from their own grapes.

Table A2.11. Distribution of the sub industries of beverage manufacturing

NACE	Description	2001		2011	
		Enterprises	Turnover	Enterprises	Turnover
C110	Beverages manufacturing	100.0	100.0	100.0	100.0
C1101	Distilling, rectifying and blending of spirits	29.4	9.5	20.1	8.0
C1102	Manufacture of wine from grape	41.9	12.3	45.9	15.1
C1103 & C1104	Manufacture of cider and other fruit wines & other non-distilled fermented beverages	3.8	1.2	4.4	1.2
C1105 & C1106	Manufacture of beer & malt	12.8	31.7	18.0	33.7
C1107	Manufacture of soft drinks; production of mineral waters and other bottled waters	12.1	45.3	11.5	42.1

Source: BFS Mehrwertsteuer Schweiz.