

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Economics**



**Diploma Thesis**

**International trade of the Czech Republic with Germany  
Case study of milk**

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## DIPLOMA THESIS ASSIGNMENT

Michaela Ondráčková

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Thesis title

**International trade of the Czech Republic with Germany – Case study of milk**

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### Objectives of thesis

The goal of this thesis is to analyze an international trade of the Czech Republic with Germany from its beginning till present day. Further are taken into account internal and external factors, that play an important role in the Czech-German foreign trade and that might significantly influence the future trade relationship between these two countries. And last but not least, for narrowing of this broad topic, the paper is focused on the dairy sector, where the possible international development between the Czech Republic and Germany is outlined by means of the trend from past as well as by means of the current aspects.

### Methodology

The methodology of this thesis lies in compilation of secondary data from special literature, periodicals, scientific articles and internet sources. For description of international trade issue was used quantitative and qualitative research. Within the case study focused on agricultural commodity milk, were taken into consideration all aspects regarding to international trade a than to outlined its possible development.

## **The proposed extent of the thesis**

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## **Keywords**

Germany, Czech Republic, Export, Import, International trade, Milk.

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- Bošková, I 2013, 'Collaboration in the Czech Dairy Chain', *Agris On-Line Papers In Economics & Informatics*, 5, 4, pp. 35-45, Academic Search Complete, EBSCOhost, viewed 9 March 2015.
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### **Declaration**

I declare that I have worked on my diploma thesis titled " International trade of the Czech Republic with Germany – Case study of milk" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any third person.

In Prague on 30. 3. 2016

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Michaela Ondráčková

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# Mezinárodní obchod České republiky s Německem Případová studie mléka

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## International trade of the Czech Republic with Germany Case study of milk

### Souhrn

Tato diplomová práce se zabývá analýzou mezinárodního obchodu mezi Českou republikou a Německem. Vzájemný obchod mezi těmito zeměmi je ukázán na obchodu s mlékem a mléčnými produkty. V práci jsou zahrnuta teoretická východiska týkající se mezinárodního obchodu jako typy, role a teorie mezinárodního obchodu a mezinárodní obchod s mlékem a mléčnými produkty na úrovni světové, Evropské Unie a mezi Českou republikou a Německem. V neposlední řadě jsou porovnány největší mlékárny v Německu a České republice a popsán vývoj obchodu s mlékem a mléčnými produkty mezi Českou republikou a Německem.

**Klíčová slova:** Německo, Česká republika, export, import, mezinárodní obchod, mléko

### Summary

This thesis is focused on analysis of the international trade between the Czech Republic and Germany. The mutual trade between those countries is shown on the trade with milk and dairy products. In thesis are included theoretical themes regarding to the international trade such as types, roles and theories of the international trade and the international trade with milk and dairy products on the world level, European Union and between the Czech Republic and Germany. Last but not least are compared the biggest dairy plants in Germany and the Czech Republic and development of trade with milk and dairy products between the Czech Republic and Germany is described.

**Keywords:** Germany, Czech Republic, export, import, international trade, milk

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# 1 Introduction

In this thesis is outlined the development of the mutual Czech-German trade with focus on milk and dairy production. Germany represents one of the most important trade partner for the Czech Republic for already many years. It is caused predominantly because of the common history and geography. After the Second World War till the fall of the communism in the Czech Republic in 1989, the Czech-German trade was very weak, however after this period came to recovery, which is an evidence, how is the mutual trade between these two countries deeply rooted.

Paper is also devoted to the short description of the international trade, its historical development, forms and roles, theories of the international trade and Common agricultural policy, that influenced amount of the production of milk in the European Community as well as expenditures on agriculture from European Community budget that had to be regulated by means of several reforms.

The Czech dairy sector, its typical features and importance, that is obvious due to a fact, that represents the largest share of the agricultural turnovers in a long term, are described. Two milestones, the fall of communism and European accession had an impact on the structure of dairy production in the Czech Republic. The crucial part of this paper is Czech-German dairy trade. The problem with export of a raw milk and consequent import of processed dairy products between the Czech Republic and Germany, that is very complex, is explained. Besides several internal and external factors, the largest Czech and German dairy companies are enumerated and described, for better evaluating, which elements can play an important role for the future development of dairy trade between the Czech Republic and Germany.

## **2 Objectives and methodology**

### **2.1 Objectives**

The goal of this thesis is to analyze an international trade of the Czech Republic with Germany from its beginning till present day. Further are taken into account internal and external factors, that play an important role in the Czech-German foreign trade and that might significantly influence the future trade relationship between these two countries. And last but not least, for narrowing of this broad topic, the paper is focused on the dairy sector, where the possible international development between the Czech Republic and Germany is outlined by means of the trend from the past as well as by means of the current aspects.

### **2.2 Methodology**

The methodology of this thesis lies in compilation of secondary data from special literature, periodicals, scientific articles and internet sources. For description of international trade issue was used quantitative and qualitative research. Within the case study focused on agricultural commodity milk, were taken into consideration all aspects regarding to international trade and than outlined its possible development.

## 3 Literature review

### 3.1 Definition of the international trade

To define the term the international trade is necessary to delineate the word trade. The trade is real and financial economic transactions regarding to the exchange of goods and services, when there are different individuals of producer and consumer in space and time. The trade is inseparable part of the market economy and one of the oldest forms of social relationships (Štěrbová, 2013, p.13).

The international trade is defined as the exchange of goods and services between countries. It is possible to carry out directly by means of exchange trade (barter trade) or indirectly, by means of money. The international trade is historically the oldest and the most spread form of external economical relations. The international trade has two sides, import and export. The objectives of international trade are goods, services and intellectual property right (Fojtíková, Lebieczik, 2008, p.1; Heakal, 2003).

Another definition of the international trade is from Štěrbová that says it is a sum of foreign trade activities of two and more national economies or countries, if their borders are identical with borders of economies, it means that international trade is a sum of two or more foreign trades. The international trade is characterized by few specifics:

- *Cultural-social differences* – people in every culture and society have their own and typical needs, values, traditions, behaviour of individuals as well as groups, language, religion etc.
- *Political – legislative differences* – there are differences in political systems, political stability of countries, attitude towards to international companies, legal code of entrepreneurship of international entities, control of ownership, dispute solution and so forth.
- *Economic differences* – there are differences among countries in factor production endowments, sources such as soil, natural resources, labour, capital, technologies, information, factors that influence demand, the level of development, the level of macroeconomic indicators.
- *Institutional differences* – there are different implementations of trade policy, membership of states in integration groupings and activities of international organizations.

The international trade is represented by trade operations and institutions with foreign elements and the foreign element can be defined by two ways, which implies two interpretations of the foreign trade:

- *The cross-border trade* – the foreign trade means the transaction of goods and services over the national borders regardless of economic competency of seller and buyer. This concept is historically older and it is based on identification of national economy and the country. The cross – border trade is prevailing in practice, during the creation of trade policy of countries, integration groupings and statistics.

- *The trade in value added* – the foreign trade is the trade among residents and nonresidents of the country regardless of state borders. This concept is newer and it reacts on the changes in the world economy. The trade in value added is used in economic theory, in statistics of GDP and statistics of balance of payments (Štěrbová, 2013, p. 13).

The effect of the international trade is obvious everywhere. When we go to the supermarket and we are able to buy bananas from Costa Rica, coffee from Brazil or toy produced in China, we are experiencing result of international trade every day. Since we are able to purchase goods and services from countries all over the world, the international trade causes greater competition, when only the best companies can survive and it has got and impact on the price of the product, that must be cheaper because of price pressure from abroad (Heakal, 2003).

## **3.2 Forms of the foreign trade**

### **3.2.1 Traditional forms of the international trade:**

*Export* – transaction of goods and services from domestic economy to foreign economy (the sale of resident to non-resident)

*Import* – transaction of goods and services from abroad to domestic economy (the sale from non-resident to resident)

*Reexport* – combination of import and export, the import of goods or service by resident of domestic economy from abroad with subsequent export

*Reimport* – combination of export and import, the export of goods or service by resident of domestic economy to abroad with subsequent import (Štěrbová, 2013, p. 16).

### 3.2.2 Non traditional forms of the foreign trade

*Simple transit trade* – trade among non-residents of economy

*Ennobling trade* – import of goods by non-resident of domestic economy from abroad with the purpose its ennobling or reparation and subsequent export

*Merchanting trade* – purchase of goods by resident of domestic economy in abroad from non-resident with subsequent sale to another non-resident without realization of import of goods

*Quasi-transit trade* – import of goods by non-resident of domestic economy from abroad with subsequent export, usually within the same integration grouping. For example the Rotterdam effect in the European Union, when Rotterdam is in a long term a centre for quasi – transit trade operations from the Third countries (Štěrbová, 2013, p. 17).

There are two different points of view of the international trade, the commodity structure and territory that is divided into following three kinds:

*Trade inside of regions – intra-regional trade* for example within Europe, North America or Asia and *intra trade*, for example within the EU, NAFTA, CEFTA or MERCOSUR.

*Inter-regional trade* – the foreign trade of the Europe with Asia or Asia with North America and *extra trade*, for example the foreign trade of the European Union, foreign trade of NAFTA

*The world trade* – includes all countries in the world that represents the broadest concept of the international trade.

The commodity structure point of view and character of trading parties in the international trade is possible to distinguish into:

- *Intra-industry trade*, where in the structure of total export and import prevail the same groups of goods and services.
- *Inter-industry trade* – the structure of total export and import is different.
- *Inter-firm trade* – the trade is realized between parent company and its filials and among filials within transnational companies.
- *Inter-firm trade* – participants of trade relation are not mutually interconnected in term of ownership, the specific case of inter-firm trade is foreign outsourcing, transfer of part of company's activities to another foreign companies (Štěrbová, 2013, p. 17).

### 3.3 Roles of the international trade

The role of the international trade in national economy is important predominantly in small or economically developed countries, that have a significant share of the international trade in GDP or per capita. There are different roles of the international trade in every economy, however they are distinguished by those four basic functions:

- *Transformational role* – it represents the transformation of domestic structure of the production to demanded structure of domestic consumption. Import enables settlement with high production costs, natural limits such as lack of natural resources, climate conditions etc. and continuity of domestic production in term of purchase of new technologies for development of new branch, overcoming of shortage of qualified labour, foreign loans and the like.
- *Transmission role* – it contributes to increase of international competitiveness of economy by means of transmission of information about new quality, new technologies and know-how. The domestic trade adjusts to demands from more demanding international market.
- *Growth role* – it represents the fact, that the economic development grows faster and it enables specialization of domestic economy. The specialization brings savings of labour and time, which leads to increase of productivity. Factors of the specialization are:
  - Differences in absolute costs of labour (theory of absolute advantage)
  - Differences in comparative (relative) costs of labour (theory of comparative advantage)
  - Differences in factor endowments (Heckscher – Ohlin theorem)
  - Differences in technologies – economy has a comparative advantage till the time, when the country, where is the product imported will start with production of this good
  - Differences in techniques of development of products
  - Differences in human capital
  - Geographical factors – industry areas, differences in political, regional, cultural and climate conditions

- *Interaction role* – it means the interaction between increase of income and development of import and export. The import is increasing function of income, because with increase of income is the consumption higher, which also includes products from abroad. Increase of export causes increase of aggregate demand and also income. The increase of export and subsequently of income leads to the increase of import.
- *Barrier role* – the international trade can cause slump of growth of economy. It is connected with defence of protectionism. There are some points, that explain, how the international trade can harm domestic market:
  - Problem of unfavourable specialization – economy is focused on the export of goods with lower value added, for example agricultural production and natural raw materials or when specialization is a result of administrative decision. It is explained by:
    - Immiserizing growth – increase of export from developing countries is accompanied by faster decrease of world price, that leads to worsening of consumer possibilities of these countries. When countries react for decreasing of prices to increase of export, than they push price more down and get into vicious circle.
    - Theory of dependency of economies – prices of raw materials and food, that are exported from developing countries, grow slower than prices of processed, industrial products, that are imported to developing countries. It causes worsening of developing economies.
  - Problem of insufficient level of development – involving into international trade leads to slow-down or ending of less competitive sectors:
    - Theory of children's sector – new branches have to be safed from foreign competitiveness, till they will become internationally competitive.
  - Problem of vulnerability – within the large openness of economy, international trade is one of the channel of transfer of recession from abroad (Tuleja, Nezval, Majerová, 2007, p. 67, Štěrbová, 2013, p. 24).

### **3.4 Reasons of international trade**

There are two basic reasons why does some country import goods from other country. In first case the country purchases goods from abroad, because it is not possible to produce there, for instance banana import to the Czech Republic. The second reason of international trade seems to be for majority of people senseless. Country is importing goods and services in spite of it has got capability to produce by itself. The Czech Republic imports dairy products from other countries and especially from Germany even it is self-sufficient. Why is it like that? Why is it not produced within the Czech Republic by Czech employees with Czech facilities? Would it not be better for Czech economics? We can find the justification in those claims:

- Some imported goods are cheaper than those produced in the Czech Republic.
- Imported goods enable the greater and more various offer on the market.
- The imported goods can have additional exclusive features, that are crucial for consumer such as additional label regarding to environment or child labour, better quality of design, better ingredients, better amount of ingredients etc. (Reuvid, Sherlock, 2011, p. 3).

The comparative advantage that was introduced by David Ricardo in 19<sup>th</sup> century is very important trigger of international trade. The essence of comparative advantage lies in mutual economic benefit, the country will produce those goods and services in that has a relative advantage and will exchange for goods that are not advantageous for producing in this country and export it from other country that has got comparative advantage. In macroeconomic scale the overall wealth of world will rise when each country will produce in what it does the best. Of course the theory is not faultless, it did not take into account the consumers demand, artificial barriers such as tariffs, quotas and transport costs (Reuvid, Sherlock, 2011, p.4).

### **3.5 Historical development of the international trade**

The international trade is historically the oldest and the most widespread form of mutual economic relations among countries. There are four great periods of development

of the international trade, Antiquity, The period of trade routes, the New Age and the Modern Times (Štěrbová, 2013, p. 25).

During the prehistory the international trade was carried out within the different types of tribes, that lied in occasional, sometimes even regular exchange of goods among particular tribes. For Antiquity (beginning of civilization till the end of Western Roman Empire in 476) was typical development of first states, gradual separation of agriculture and crafts and development of trade in modern form. The biggest trade centres in that time were Egypt, India, Babel, Phoenicia, Greece and Rome, that traded with oil, wine, ceramic and metal products, iron, copper, asphalt, spices and slaves. The dependency on labour of slaves slowed down the economic development of ancient states and it followed into their extinction (Štěrbová, 2013, p. 26).

In the Middle Ages (476 till discovering of America in 1492) was the international trade focused into areas of Arabia, Byzantine Empire, Italy, Spain, France and Germany. The development of cities and markets because of gaining independence of crafts lead to the fast development of international trade. The permanent trade routes with traditional goods such as grains, amber, honey, wax, silver, copper, tallow, spices, silk, iron and so forth were created. The development of trade led to independence of trade profession. Merchants in the Europe united into trade unions, from that the most important was Hanseatic league in 13<sup>th</sup> to 17<sup>th</sup> century. The Hanseatic league had centre in German city Lübeck and extended from London to Novgorod. Since the 13<sup>th</sup> century started development of banks and in Italy, particularly in Florence, Genoa and Napoli were established first methods of ensuring of trade and due bills (Štěrbová, 2013, p. 26).

The New Age (1492 till 1870), in another words the period of discoveries, is characterised by development of seaborne trade, port cities, formation of colonies and monopol of colonial trade, transition of natural economy towards to money economy, industrial revolutions and creation of capital companies and stock exchanges. Seaside countries such as Portugal, Spain, the Netherlands and France, later replaced by the Great Britain in 19<sup>th</sup> century were trade great powers. The importance of Germany and Russia in the international trade increased too. The foreign trade policy became an important part of policy of the country. The strong feature of foreign policy till 18<sup>th</sup> century was protectionism and later was implemented liberalism with development of trade, exchange and naval law and trade agreements between states (Štěrbová, 2013, p. 26).

The Modern Time (since 1870 till nowadays) is consisted from four periods:

- Period of growth (1870 – 1913)
- Inter-war period (1913-1950)
- Post-war period (1950-1989/1991)
- Present period (1991- present)

The Modern Time is distinguished by after war reconstruction, break-up of colonial system, change of agriculture policies, creation of Bretton Woods system (1944-1976) and since 1980 by transmission of free exchange of currencies, creation of the international trade system, for example General agreement on tariffs and trade (GATT) in 1947 and subsequently the World trade organisation (WTO) in 1995 and later liberalization of the international trade. The internationalisation of entrepreneurial activities such as outsourcing or offshoring and growth of intra-industry trade and inter-firm trade were common for period of 1960-1970. The main centres of the trade became the U.S., Germany, Japan with growing share of Asian states (new industrialised countries such as Hong Kong, Singapur, Tchaj-wan, South Korea, China, countries of ASEAN etc.) and regional integrated groupings (European Economic Community, which was renamed in 1993 to the European Union). Typical features of current international trade are deepening processes of globalisation, regional integration, an utilization of information and telecommunication technologies, international global value chains, which means, that the production is divided into more countries and by the world crises, that started in 2007 in the U.S. and one year later in the rest of the world (Štěrbová, 2013, p. 27).

### **3.6 Theories of the international trade**

It is indispensable to mention theories of the international trade and their preconditions for better understanding of the international trade. The theory of the international trade is focused on economic problems such as:

- Causes of trade and problem of price determination in foreign trade
- Efficient allocation of production factors among countries
- Redistribution of income and wealth among countries
- Growth of domestic economy by influence of the foreign trade
- Mechanism of functioning of the world trade

- Institutional organisation of economies due to involvement into the world economy

The theory of the international trade is developing in the course of the time, which is described below (Tuleja, Nezval, Majerová, 2007, p.69).

### **3.6.1 Mercantilism**

Mercantilism is regarded for the first modern economic theory and philosophy that was gradually developed in Western Europe in 16<sup>th</sup> and 17<sup>th</sup> century by rich merchants and politicians (Keřkovský, Luňáček, 2012, p. 4).

The period of mercantilism was very long. The mercantilism is characterized by heterogeneity, however proponents of mercantilism shared the same idea about doctrine of trade balance and the aim to increase the national wealth. According to this theory the wealth of the country is assessed by the amount of money in the country. By the term money was meant holding of precious metals that should be expanded by the nation. The increase of the wealth of the country could be carried done by two ways: either by mining of precious metals or by active trade balance (Tuleja, Nezval, Majerová, 2007, p.69).

The main element of mercantilists was not individual but it was a state that should assert a national interest, power and unity. The mercantilism represented strong position of state and extensive regulations of economic activities (Fojtíková, 2009, p.8; Šrédľ, 2009, p.9).

Due to the fact that the theory held the opinion, that it is necessary to hamper the import of goods and support of development of export, the mercantilism is considered as an economic nationalism, where government plays an important role in protection of national economy. The main aim of this theory was to reach export surpluses over import and to cause inflow of money to the country (Fojtíková, 2009, p.8; Šrédľ, 2009, p. 9).

If the country did not have enough gold and silver resources, it was possible to gain a country's wealth by exchange. The trade inside of one country was regarded like only shift of wealth between individuals, but not for the enlargement of country's wealth. Therefore the major source of national wealth lied in the international trade. The money inflow to the country causes the grow of country's wealth and the money is a tool to gain a bigger amount of money. This policy was strengthen by so called navigation laws, that regarded to transport of goods on the sea and which forced colonies to trade only with „mother“ country. Another measures were for example subsidizing of exports and taxation

of imported manufactured products. The „mother“ country of mercantilism was England and later was extended to France, Germany, Austria, Czech countries and Russia, where influenced economic reforms and policy of the tsar Petr I. (ŠrédI, 2009, p. 9).

The most significant proponent of mercantilism was Thomas Mun, who was criticised, because the East India company which he regulated, had a negative trade balance with India. Mun argued, that it is not needed to have a positive trade balance with every country, however it has to be positive in total. He became aware, that positive trade balance increases an amount money in economy and it causes an increase of price level and decrease of price competition of domestic producers (Tuleja, Nezval, Majerová, 2007, p. 69).

### **3.6.2 Theory of absolute advantage**

The theory of the absolute advantage was founded by a Scottish philosopher and economist Adam Smith, in 18<sup>th</sup> century. He criticised mercantilism due to the fact, that it takes ability of individuals to trade freely and to profit from voluntary exchange trade. Adam Smith supposed, that there is only one type of production factor, labour. The main idea of this theory is, that two countries or two individuals want to exchange two different goods and the absolute advantage represents the based for the mutually profitable trade. The comparison of labour productivity is the core of the absolute advantage. It is also possible, that country or individual has no absolutely advantage in anything, which means, that no trade will happen with other traders, because according to theory both parties have to gain. For example the production efficiency of Japan is car manufacture, however the USA is efficient in producing of computers. Japan is weak in computer production and the USA in car production, therefore Japan has the absolute advantage over the USA in car production and on the contrary the absolute disadvantage in computer production. The absolute advantage of the USA is by contrast of Japan example. According to Smith's theory, the most profitable for every country would be to specialize in the production of goods that have the absolute advantage and trade them for goods that are not beneficial to manufacture for them. In general country has the absolute advantage over a trading country, if it can produce more of an output with a given amount of inputs. Adam Smith was a great proponent of the free trade and asserted, that by means of the free trade, the

world would use its resources the most efficiently which would lead to the biggest world welfare (Zhang, 2008, p. 24).

### **3.6.3 Theory of comparative advantage**

David Ricardo, the English economist is regarded for the originator of the classical theory of the international trade. The predecessor of David Ricardo, Adam Smith created the basic for international trade and Ricardo showed, that the the idea of absolutely advantage is greater than it was stated (Zhang, 2008, p. 25).

According to this theory the main variable of the international trade is technology. The comparative advantage considers a difference in comparative costs of production vital for the international trade and by these differences are meant different production technologies. It explained, how the international trade is beneficial under certain conditions even though one nation is able to produce all kinds of goods with lower costs than the other. The comparative advantage occurs, when country or individual during the production of certain product has to sacrifice less of other product than the other country or individual (Zhang, 2008, p. 25).

### **3.6.4 Heckscher-Ohlin trade model**

The Heckscher-Ohlin trade model (H-O model) or in another words theory of relative factor endowments was developed by two Swedish economists, Eli Heckscher and Bertil Ohlin. The model is based on David Ricardo's theory of comparative advantage, however it is more advanced. The Heckscher -Ohlin model takes into account the fact, that there are differences regarding to factors of production among countries, which are the sources of the international trade. The model explains the comparative advantage on the basis of factor endowments. The Swedish economists worked on the two assumptions:

- Countries vary in relative factors of production facilities.
- Goods vary in relative difficulty of factors of production.

It is assumed that country will export goods, that use the cheap factors of production and are available in the great amount and import goods, that use the factors of production in short supply of the country. Heckscher and Ohlin worked on the assumption, that the price of the production factor is dependent on its relative supply. In case that there

is an abundant of certain factor, its price will be low, if there is a shortage of the production factor, its price will be high (Tuleja, Nezval, Majerová, 2007, p.72).

The model indicates, that the international trade should lead to price equalization of factors of production, which in the reality does not work because of trade barriers with factors of production and the usage of different technologies. The factor endowments of countries can be determined by different natural conditions such as soil, climate or natural resources. The basic explanation of the H-O trade model lies in different natural resources in different parts of the world. For example the USA and Canada have abundant arable land in relation to the land and therefore they have a comparative advantage in production of agricultural crops such as wheat or maize. Another example is the Japan that does not have a sufficient arable land and conditions for that and therefore has to import the kinds of goods. The Sweden has the comparative advantage in production of timbers, because of great area of forests, Norway in fishing, because the coastline area is rich for fishes, India for tea and there are many other examples (Holman, 2007, p. 235).

In some cases, the factor endowments is a result of historical development. The copybook example is the America. The USA and the Canada had a close relationship with the United Kingdom. The U.K. exported to them a capital that significantly contributed into their industrial growth. The labour was coming to the America in a form of well educated people. The USA and the Canada became countries rich for capital because of this sequence of events and got the comparative advantage production of goods that demand lot of capital. Another economic development was in the Latin America. This area had a good relationship with Spain and Portugal that were not so industrially developed like U.K., France or Germany and could not provide the needed capital to Latin America. Additionally political regimes in Latin American's countries did not give opportunity to develop the free trade and therefore the Latin America remained the area that is poor for capital. The Heckscher-Ohlin trade model describes the international trade after the World War II., while the Ricardian model is applicable for the period before The World War II. (Holman, 2007, p. 236).

### **3.6.5 Leontief paradox**

The Leontief paradox is regarded for the most important test of the Heckscher - Ohlin trade model. The American economist of Russian origin, Wassily Leontief figured

out that in the period 25 years after the World War II, the USA exported goods that are demanding for labour and not for capital, how he supposed. Leontief denied that countries with high share of capital has to export mostly capital demanding products. Leontief explained it, that the USA has three times bigger productivity, than it is common in the rest of the world and therefore why the amount of the labour should increase three times. Current economists claim, that high productivity is caused by high qualification that demands large investment (Tuleja, Nezval, Majerová, 2007, p. 73; Lawler, Seddighi, 2001, p.76).

### **3.6.6 Stolper – Samuelson theorem**

American economist of Austrian origin, Wolfgang Stolper and his American colleague, Anthony Samuelson extended the theory of relative factor endowments. Heckscher and Ohlin presumed, that all prices of production factors are constant, however Stolper and Samuelson asserted, that if the economy enters the international trade, it will cause the change of price of production factor as well as the world price of the good. It means, that the increase of the world price of good causes the increase of price of that factor, for which the production is relatively more demanding and decrease price of that factor, for which the production is less demanding. The Stolper-Samuelson theorem shows, that not all economies take benefit from joining to the international trade. For instance, those economies that own capital will have higher profit, than those, that own labour. Free trade decreases differences in prices of factors among countries with different production endowments (Tuleja, Nezval, Majerová, 2007, p. 73).

## **3.7 Trade policy**

Trade policy is a sum of intentions, strategies, principles, measurements, tools, agreements and institutions, created on the government level and heading to the domestic and also foreign business subjects. By means of the trade policy of government they influence business environment and trade relationships of business people with aim to ensure an optimal inter economic development of national economy in long, medium and short time (Štěrbová, 2013, p.99).

Beside the general aim, that is an optimal development of internal economy, is the trade policy used to reach in advance specified partial aims of government in certain areas of the economy. By means of the trade policy, the government involves the economy into the international trade relationships and causes changes in allocation of production resources and redistribution of profits. It is possible through the trade policy to solve problems in trade balance of the country indirectly, partially to solve problems with unemployment and inflation and in some countries they use trade policy for solving a problematic with lack of state income into its budget. The trade policy is an inseparable part of all policies of a country, through which the state regulates foreign relationships and economic and social development of the country (Štěrbová, 2013, p.99).

The impact of the trade policy on the economy of the country depends on the openness of economy and its involvement into international trade and capital flows. The trade policy arranges a trade exchange and creates a favourable or unfavourable environment for foreign subjects during their accession to the domestic market and affects transaction costs of the trade such as transportation, administration and customs procedures for gaining certification, labelling etc. The World trade organisation (WTO) estimates, that sometimes the transaction costs represent 80% of the price of some trade operations (Štěrbová, 2013, p.102).

### **3.7.1 Liberalism and protectionism**

Two ways of the trade policy were developed in course of the time: liberalism and protectionism. This division is only theoretical, because there is no clear example in the reality. The share of the more liberalism and more protectionism trade policy depends on few factors. Both approaches bring to national economy advantages and disadvantages and therefore it is needed to take into account their short and long impacts to the economic and social sphere (Štěrbová, 2013, p.104).

### **3.7.2 Liberalism**

Liberalism, in term of trade policy means a removal of trade barriers, opening of all sectors of internal trade to a foreign competition and absolute removal of pro-export, direct and indirect state support in all areas of economy. The aim is to reach free foreign trade exchange without state interventions. The liberalism can show positively and also

negatively. It also depends on other economical and social conditions in the country. In general, the liberalism causes a penetration of foreign influences to the domestic production and it leads to a change of production structure, increase of the competition on the domestic market, increase of a specialization of the economy, higher possibility of realization of comparative advantage from foreign trade exchange, decrease of customers prices and to a certain extent to price stabilisation, elimination of inflation, decrease of wages, increase of unemployment, higher vulnerability of the economy because of dependency on strategic imports and monopoly controlling of the domestic market by foreign importer (Štěrbová, 2013, p.104).

### **3.7.3 Protectionism**

Protectionism, in term of trade policy means protection of domestic economy against external influences, it strives to filter negative external influences. Protectionist measurements can have a positive effect in a short term, however in course of the time more negatives will appear. This trade policy was often used between 1920 and 1930 like an answer for the world crises. Protectionism was also used for after war economies with intention of fast recovery. Protection of certain industry will keep employment and higher wages for some time, nevertheless products cannot go to the foreign market and in case that the domestic market does not have sufficient demand, sales are decreasing and it goes hand in hand with lower profits, that can cause dismissal and liquidation. Another negative aspect is, when the import decreases and the only domestic production impedes to a progressive effect of foreign technologies and know-how. Export is decreasing and all domestic economy is getting isolated. In general the protectionism keeps production structure, repression of the competition on the internal market, slow technological development, lower benefits from comparative advantages, higher production and customer prices, higher wages and employment, tendencies to inflation, selfsufficiency of economy and than insufficient supply on the market and decrease of a dependency of the country on imports. The current form of protectionism is localization of the market. This trend ensures protection and support of production for domestic market. It is usually focused on agriculture and restricts its export. The purpose of the localization is to protect domestic resources against their disproportionate usage, ensure source of livelihood from domestic production and decrease a dependency on import (Štěrbová, 2013, p.105).

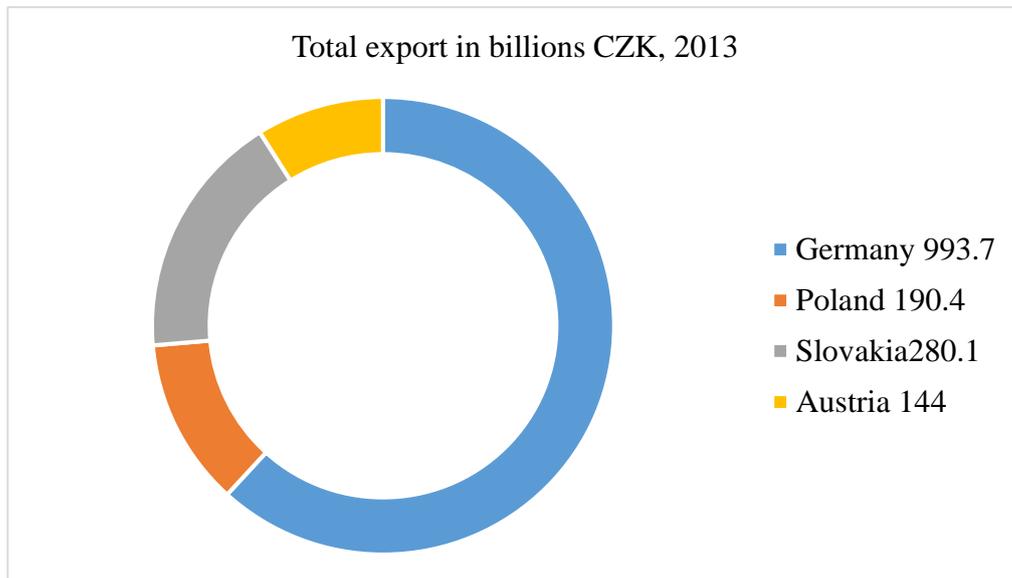
Autarky is an extreme case of the protectionism, where there is no possibility of imports and the domestic market is closed. The country does not use comparative advantages and it leads to the poverty, outdated technologies, increase of production costs, inflation and illegal trade. Democratic system does not enable the autarky, its realization is possible only in the central regulated economy. Albania and partially China strived autarky in the past. The example of the present day is North Korea (Štěrbová, 2013, p.105).

### **3.8 The Czech Republic and its international trade**

The half of export of the Czech Republic and more than two fifths import are realized with neighbouring countries. Germany, Poland, Slovakia and Austria represent 63% of turnover from international trade with member countries of the European Union. The Czech export outside of the EU is carried out most to the Russia and the most of import comes from China (Statistika&My, 2014).

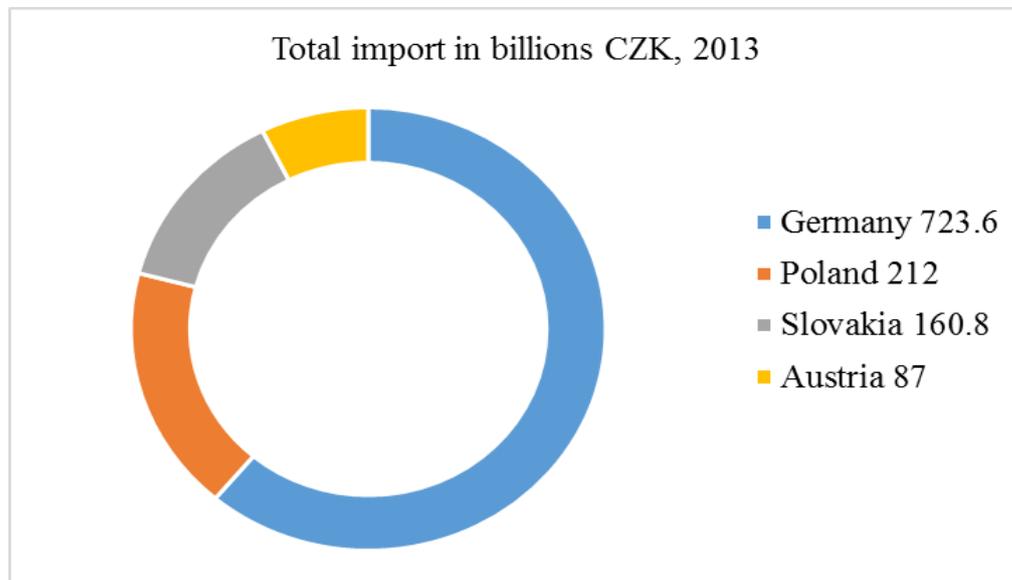
The graph number 1 shows that overall export of all kind of goods in the year 2013 is with significant superiority realized to Germany (993.7 billions CZK), it is followed by Slovakia (280.1 billions CZK), Poland (190.4 billions CZK) and Austria (144 billions CZK). On the other hand the most imported goods are coming from Germany (723.6 billions CZK), Poland (212 billions CZK), Slovakia (160.8 billions CZK) and Austria (87 billions CZK) and they are captured in the graph number 2. It is easy to calculate the balance of international trade with certain countries looking at these numbers. There is a positive balance with Germany, it is 270.1 billions CZK as well as with Slovakia, where annual export exceeds annual import by 119.3 billions CZK. The same positive situation is with Austria, where the positive balance is 57 billions CZK. On the other hand the import from Poland surpasses export to the Czech Republic by 21.6 billions CZK.

### Graph No.1: Export of the Czech Republic



Source: Author's adaptation according to Statistika&My, 2014

### Graph No.2: Import of the Czech Republic



Source: Author's adaptation according to Statistika&My, 2014

The overall international trade with agricultural commodities in the Czech Republic in the period 2009 -2014 is shown in the table number 1. The trade balance with agricultural commodities is negative in a long term, but this number is decreasing and may be in the next years the export will exceed the import. The balance deficit in year 2014 was -18 billions CZK and it was the lowest since the EU accession of the Czech Republic. Last

years the annual turnover is getting better with every year. The share of agricultural commodities on the total international trade is in a long term higher on the side of import, than export, in year 2014 it was 6.2%.

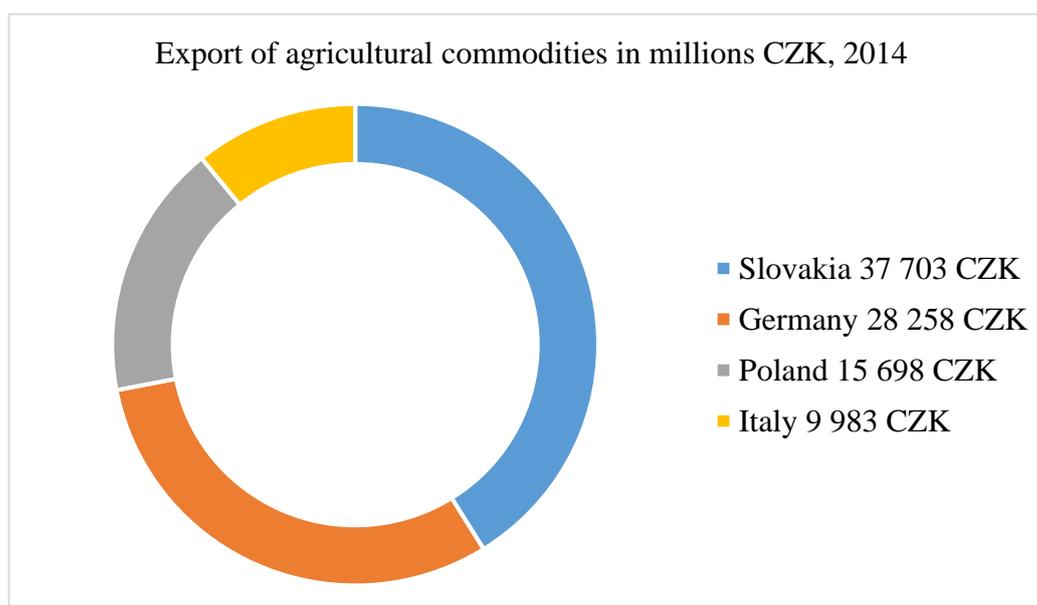
**Table No.1: International trade with agricultural commodities (in bill. CZK)**

Indicator/year	2009	2010	2011	2012	2013	2014
Turnover	235.4	245.4	277.1	321.3	345.3	375
Export	101.7	105.4	120.4	148.3	160.6	175.5
Import	133.7	140	156.7	173	184.7	196.5
Trade balance	-32	-34.6	-36.3	-24.7	-24.1	-18

Source: Author's adaptation according to MZV, eAGRI, 2016

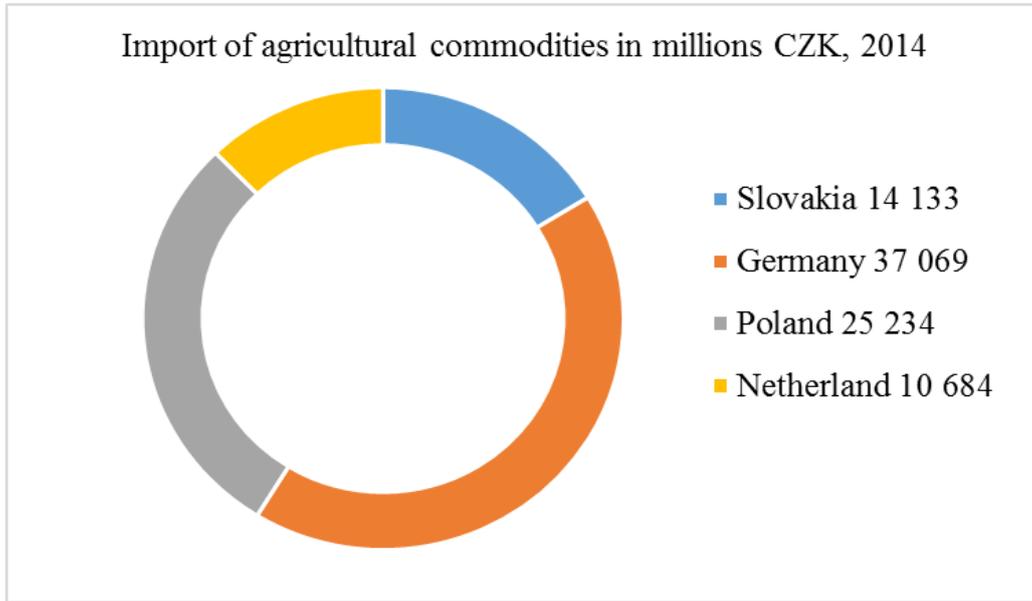
Graphs number 3 and 4 shows the the most tradable countries with agricultural commodities in year 2014. On the side of export they are Slovakia, Germany, Poland and Italy. The majority of imported agricultural commodities are coming from Germany, Poland, Slovakia and Neatherland. The international trade with agricultural commodities coming from Germany was for the Czech Republic negative in 2014.

**Graph No.3: Export of agricultural commodities of the Czech Republic**



Source: Author's adaptation according to Statistika&My, 2014

**Graph No.4: Import of agricultural commodities of the Czech Republic**



Source: Author's adaptation according to Statistika&My, 2014

### **3.9 Current situation of the dairy sector on the world market**

The world milk production is affected by weather conditions (cold and long winter with expensive inputs) and all milk market is highly dependent on demand from China. The per capita consumption in China is increasing because of government effort, that implemented set of policies to promote dairy production and invested into technologies (FAO, 2012, p. 8).

According to FAOSTAT data the world milk production has increased in last 30 years, it was 482 million tonnes in 1982 and in 2012 was the result by more that 50% higher, precisely 754 million tonnes. The world's largest milk producer is India, it covers 16% of global production, another big producers are United States of America, China, Pakistan and Brazil. New Zealand, the USA, Germany, France, Australia and Ireland have the highest milk surpluses and on the other hand China, Italy, Russia, Mexico, Algeria and Indonesia has the greatest lack of milk (FAO, 2015). In case that the amount of milk production is calculated within regions, that the biggest producer is the European Union with production of 151 750 thousand tonnes in year 2015, followed by India and United states. More information are recorded in table number 2.

**Table No. 2: Amount of the milk production according to region, in 1000 tonnes**

Region	2011	2012	2013	2014	2015
European Union	142 920	143 750	144 850	151 450	151 750
India	123 000	129 000	134 500	140 500	146 500
United States	89 020	91 010	91 271	93 531	96 252
China	31 980	33 960	35 750	37 500	38 984
Brazil	30 715	31 490	32 380	33 350	34 500
Russia	31 646	31 831	30 529	29 900	29 300
New Zealand	18 965	20 567	20 200	21 742	22 120
Mexico	11 213	11 434	11 411	11 599	11 760
Ukraine	11 085	11 378	11 488	11 510	11 470
Argentina	11 470	11 679	11 519	11 404	11 746
Australia	9 568	9 811	9 400	9 700	9 800
Canada	8 400	8 614	8 443	8 409	8 535
Japan	7 474	7 631	7 508	7 315	7 350
South Korea	1 888	2 111	2 093	2 073	2 065

Source: Author's adaptation according to Milk market observatory, 2016

### **3.10 The situation of dairy sector on the EU market**

The EU is the most important milk producer in the world. Milk is an important commodity in the EU market, the dairy sector represents 15% of the total EU agricultural output. More than one million milk producers produce about 148 millions tons of milk per one year in 650 000 dairy farms. There are roughly 300 000 people working in dairy sector and making 120 billions EUR (European Commission, 2015).

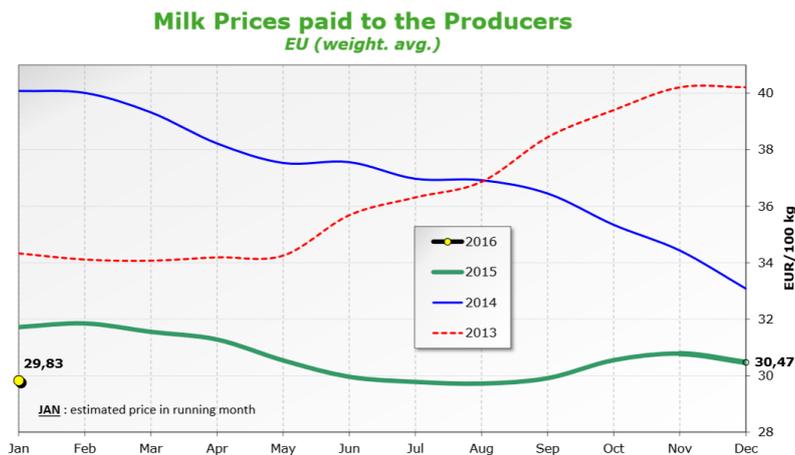
The prediction for future trend seems to be positive because of increasing world demand that is caused by growing world population as well as economic growth. It is expected that there will be higher demand for milk than supply and also bigger share of

developing countries in milk market. The demand for dairy products is increasing on the world market and therefore there should be more export opportunities for the EU. Nowadays the EU produces by 10% more milk than its consumption. One of the important aspects for Czech milk market is to keep a competitiveness on the world market and export to the developing countries.

The member states of the European Union have different structure regarding to milk production because of their economy, the size of dairy cow herds and milk yield (Eurostat, 2015).

The member countries of the EU are dependant on the development of the world milk market. To sell the European milk surpluses is possible when the world milk prices are too high or when the supply from other countries will decrease. The 45% of raw milk produced in the EU is used for cheese production and the export of cheeses from the EU will increase, this fact is very positive for milk market because it can increase its price. The average price for raw milk in the EU – 28 was 36.88 EUR / 100 kg in year 2013, however the price paid to farmers by dairy plants was decreasing rapidly in year 2015 compared to year 2013. According to EU's average, at the end of year farmers received more than 40€ per 100 kg of raw milk, two years later it was only 30.47 € per 100 kg of raw milk, which is seen in the graph number 5.

**Graph No. 5: Milk prices paid to farmers by dairy companies, the EU's average**



Source: Milk market observatory, 2016

The production of milk and dairy products was always important part of economic and social spheres and therefore there were created certain rules to protect income of milk producers. The rules for dairy sector are different from another sector in agriculture. The raw milk is very perishable and it is not easy to store and transport that's why the support from the EU is focused on the first stage of product processing such as butter and dried skimmed milk (Špička, 2013, p. 90).

The common market of dairy products and milk within the EU is protected by tariffs from the Third countries. Conditions of import must correspond to limits stated by Uruguay Round WTO. On the basis of international agreements it is possible to decrease tariffs for import of milk and dairy products with the keeping of given quotas of certain product (Situační a výhledová zpráva mléko, 2013, p. 10).

When the supply exceeds demand the EU can pay a subsidy for export of dairy products with aim to stabilise prices on internal market. The consequence of global economic crises was that the export from EU decreased in 2008. This trend was stopped in 2009 by re-introduction of export subventions. The highly processed dairy products that are exported among member countries are typical for the dairy market within the EU (A Study of the Milk Sector in Poland, Hungary, the Czech Republic and Estonia, 2007, p. 12).

The milk and dairy products policy of the EU is aimed at balance at the market with milk, stabilization of prices, ensuring of corresponding living standards of milk producers and improvement of their competitiveness.

### **3.11 Common agricultural policy**

The idea about Common agricultural policy has already emerged in 1950. The emphasis was put on sufficient amount of high-quality food and support of higher agricultural production. Three basic principles were settled within the Common agricultural policy in 1960.

- Principle of single trade represents free movement of agricultural products between member states.
- Principle of preference Community includes preference to consume agricultural products produced in member states.

- Principle of financial solidarity means financing of agricultural policy from common budget (Plchová, Abrahám, Helísek, 2010, p. 94).

The Common agricultural policy of the EU was successful in achieving its aims, however it had to face the overproduction of main agricultural commodities, that had to be stored or disposed, that was quite costly. Only fraction by means of subsidies was exported out of the European Community. The share of agricultural policy on the European Community budget was 80% in 1970 and new countries from the south Europe were before European Community accession, the new reform was necessary. There are three main reforms that significantly changed Common agricultural policy:

- McSharry reform – this reform is named after former Minister of Agriculture. Intended changes were:
  - Financial support of prices was replaced by direct payments, that are not directly related to the production.
  - Increase of intervention prices and production quotas
  - Support regarding to decrease of production (agritourism, afforestation)
- Agenda 2000 was accepted mainly because new countries from Eastern and Middle Europa were supposed to become a member states. The main points were:
  - Decrease of price supports, that was compensated by increase of direct payments
  - Bigger emphasis on safe and high-quality food and better animal treatment
  - Support of ecological side of agricultural production
  - Highlight the importance of rural development and diversification of agricultural activity (Plchová, Abrahám, Helísek, 2010, p. 95).

Not only the potential EU countries had to adapt their agricultural markets to common EU market with aim to harmonize all regulations more, but also the EU is urged to make an effort that would simplify agriculture sector. The WTO calls for liberalization of markets globally and represents the external factor, whereas the the strongest internal factors are the budget and political intention of some member states (A Study of the Milk Sector in Poland, Hungary, the Czech Republic and Estonia, 2007, p. 5).

Both types of factors were taken into account in Agenda 2000. Specifically in dairy sector were implied gradually increasing milk quotas in all member states. The Agenda 2000

stated 15% reduction of the intervention price for skim milk powder and butter, the direct aid to milk producers was implemented.

- Fischler reform was established in 2003. The most important measurements were:
  - Elimination of link for production support by implementation of single payment for one farm
  - Support payments unfold from respect of environment, safe and high-quality food, good animal treatment and good agricultural practice
  - Modulation principle, that means annual movement of part of direct payments for rural development
  - Agricultural consulting system
  - Rural development, implementation of new measurements and standards (Plchová, Abrahám, Helísek, 2010, p. 95).

The result of above mentioned reforms is decrease of agricultural policy on EU budget. The total expenditure on agriculture was 89% from EC budget, however the situation now is 42% from total EU budget in 2013 (Henke, R., et al., 2011, p. 17).

The Common Agricultural Policy influences Czech farm management radically. It is based on functioning of common trade with agricultural products and system of price supports and subsidies.

### **3.12 Milk quotas**

About the issue of milk quotas was already spoken since the late 1960s when dairy product surpluses and costs became obvious. The European Commissioner for Agriculture, Sicco Mansholt published so called Mansholt Plan that reformed CAP policy in 1968.

In 1972 were implemented three directives regarding to modernisation of agricultural holdings, leaving of farming and training of farmers. There were some attempts how to curb dairy excesses such as co-responsibility levies and guarantee thresholds in early 1980s. The European Commission established a system of maximum guarantee thresholds (European Commission, 2008).

Since the 1<sup>st</sup> April 2015 farmers of the EU member countries can produce how much they want. The milk quotas were abolished after more than 30 years and the whole market was liberalized. The raw milk was in 1984 the most important agriculture product

of European Community, it represented 19% of total agriculture production. France (24,7%) and Germany (24%) were the biggest raw milk producers within the EC.

The quotas imposed on raw cow's milk were established in 1984 to prevent the overproduction which caused that farmers had to get rid of surpluses of milk as well as butter (it was spoken about so-called milk lakes and butter mountains). The regulation CEE 856 and 857/84 which implemented milk quotas divided the certain amount of allowed production into EU member countries. There were two options, either to accept quotas by producers (regime A) or to accept it by dairy plants (regime B). Any producer who exceeded the stated quotas had to pay levy. Originally it was intended to use it only for period five years. After introduction of quotas system were different EU member countries in different situation. Speaking about Germany, the milk production in 1984 was more than one half of entire agriculture. Germany chose for the time 1984 – 1993 the regime A, it was convenient for increase of small family farms. (Kostelníková, 2014, p. 2).

Each Member State had two quotas, one for deliveries to dairies (97.6% of EU total), and the second for direct sales at farm level (2.4%). There are eight member states of EU that exceeded their milk quotas in 2013 /2014. The Annex 2 points out those countries that have to pay penalties so called superlevy, that number € 490 million in total. Penalized countries, Germany, the Netherlands, Poland, Denmark, Austria, Ireland, Cyprus and Luxembourg have produced by more 1.469 000 tons of milk than they could for year 2014 ending March 31.

The Czech Republic produced 2 585 347 tonnes of milk and with settled 9 906 440 tonnes of milk quotas did not exceed milk quotas in 2013. All data regarding to milk quotas according to member states countries are in Annex 2.

Some EU member states concern about the end of milk quotas, others welcome the opportunities provided by it. It can be problematic for small farmers and that's why they should unify. The abolition of milk quotas is one of the crucial factor which will influence the price of raw milk. The president of the European Milk Board, Romuald Schaber, is very afraid of price collapse and subsequent crisis. Since the milk quotas ended the countries can produce as much milk as they want. The production of raw milk increased in Germany due to this new situation. The current situation is very good for Germany, because producers of raw milk will not pay levy anymore, during the quotas system Germany had to pay about 15 billions euros like a fine due to exceeding of limits.

The cancellation of milk quotas will lead to more freedom regarding to decision – making, companies will produce how much raw milk they want, that means on the other hand more responsibility for producers and also price volatility. Positive consequence will be creating of new job opportunities and increasing annual additional export revenue in some countries such as Ireland (EURACTIVE, 2015).

With the end of milk quotas the increase of milk production is anticipated in countries where the milk quotas limited the amount of production. It is also case of Germany, the production will depend on the consumption in the EU, in all world and another aspects such as restrictions regarding to environment.

The main reason for ending milk quotas was that there has been a significant increase of dairy products in last years, particularly on the world market and it was supposed that the demand will still rise particularly in Asian countries. It is caused by population growth, rising incomes and changing consumer behaviour. For instance the export to the Korea increased more than two times between years 2010 and 2014 (European Commission, 2015).

Exports of milk increased by more than 25% in 2014, but also by Belarus' purchases increased, since they purchase next to the Russia. There was no export to the Belarus existing before and now they received 70 000 tonnes of milk from the EU (Short Term Outlook for EU arable crops, dairy and meat markets in 2015 and 2016, 2015, p.8).

## **4 Practical part**

### **4.1 Czech – German trade relations**

To keep good trade relations with the Germany is one of the most important priority of the Czech foreign policy. The common history, geography (the common border is 810 km) and intensity of political, cultural and economic contact contribute to this effort aiming to be Germany a respected trade partner of the Czech Republic. The close connection with Germany causes that every change in German economic has an impact on Czech economy (MZV, 2010).

The Czech – German trade relations have long term tradition, more than one third of trade turnover is realised with Germany. The import to the Germany prevails over export and therefore the trade balance is positive. Germany is also one of the biggest foreign investor of the Czech Republic and the most tradable item between the Czech Republic and Germany is traffic engineering such as car industry and motor machine production.

After the 2<sup>nd</sup> world war when Europe was divided into Western and Eastern countries, the Czech Republic realised most of its international trade within the Eastern countries, where belonged also the East part of Germany to. After 1989 the Czechoslovakia got an access to market with other countries but the trade with Germany was deeply rooted (Novotná, 2010, p. 22; MZV, 2010).

#### **4.1.1 Development of Czech – German trade relations**

Since 1918 the Czechoslovakia was the most developed country of former Austria-Hungary, because there was located about 60-70% of production capacity of industry of Austria-Hungary. The important places for international trade were German harbours Bremen and Hamburg. There was a great export to the Germany from Czechoslovakia, however the import was exceeding export, and therefore in 1929 there was an adverse trade balance 3 billions CSK. The problem was, that Czechoslovakia was not able to built direct trade relation with overseas and was dependant on German mediatory trade. The

trade with Germany decreased by 16.59% since 1924 to 1938, in spite of this fact Germany was still the best and most tradable partner for Czechoslovakian Republic (Šlapáková, 2010, p. 41).

The first deficit in international trade has emerged in 1920. The Czechoslovakian international trade was reduced significantly after the world crisis in 30<sup>th</sup> year. The national policy took it into its hands and supported export, extended embassies, consulates and export departments. One of the main political aim during the First Czechoslovak Republic was to decrease the international trade with Germany, Austria and Hungary and improve relations with France, Great Britain and USA. The top five biggest trade partners for Czechoslovakia in 1937 according of the amount of turnover were:

1. Germany (16.4%)
2. USA (9%)
3. The Great Britain (7.66%)
4. Austria (5.81%)
5. Romania (5.17%) (Šlapáková, 2010, p. 41).

The Czech – German trade relations were interrupted by the Cold War in 1945 – 1949. On the 8<sup>th</sup> of May 1945, after the Second World War, defeat of Germany and its unconditional surrender, the Germany stopped to exist. The Germany was divided into four occupation zones by winning countries – the Soviet Union, the USA, France and Great Britain. The Czech trade relations were carried out with those four countries and later since the year 1947 with three zones owned by Soviet Union, France and Bizonia (USA and Great Britain). Due to this situation there was no Czech-German trade relations, which is obvious in the five most important trade partners enumerated above this text. The Czechoslovakia used German territory only for transit of goods. The first trade contract was made in spring on 1947 with occupation zone of the Soviet Union and after that in the same year with the rest of occupation zones, however the trade relation did not reach even 10% of pre-war amount (Šlapáková, 2010, p. 44).

The order of most important Czech trade partners has changed after the 1948 because of the political situation. The five most important trade partners were according to amount of turnover:

1. Soviet Union (16.6%)
2. Great Britain (7.22%)

3. Yugoslavia (7.08%)
4. Poland (6.25%)
5. Holland (6.20%) (Šlapáková, 2010, p. 44).

At the end of 1968 the Germany was already on the 5<sup>th</sup> place of the list with Czech import and 6<sup>th</sup> place in list with Czech export. The international trade of the Czechoslovakia before 1989 was focused on Eastern market, the biggest turnover was carried out with Soviet Union and the share of trade with non-socialistic countries was only 20%. The dynamics of national economy of Czechoslovakia as well as of the international trade slow down. In 1980s the Czechoslovakia was loosing its important position on the market like an exporter to the overseas, but also to the Council for mutual economic assistance (Šlapáková, 2010, p. 50).

Since 1993 till 2004 the trade balance of the Czech Republic was negative and after EU accession the export started to exceed import. The significant change in international trade balance with Germany is seen in table number 3. In year 2000 the export from the Czech Republic has already exceeded import, however the trade balance improved greatly in favour of the Czech Republic with every more year (Šlapáková, 2010, p. 42).

**Table No. 3: The international trade with Germany (in mill. CZK)**

	1993	1996	2000	2004	2007
Export	122 406	218 874	453 521	623 099	762 341
Import	124 102	241 526	400 538	554 336	670 186
Balance	-1 696	-22 652	52 983	68 763	92 155
Turnover	246 508	460 400	854 059	1 177 435	1 432 527
The share on total turnover of the CR (%)	29.8	33.94	36.11	33.91	29.41

Source: Author's adaptation according to ŠLAPÁKOVÁ, Eva, p. 57

## 4.2 Characteristics of Czech dairy sector

The production of milk belongs to the most significant sector of animal production as well as agricultural production. The milk production in the Czech Republic helps to keep the employment in agriculture and represents the biggest share of agricultural turnovers. The dairy industry in the Czech Republic represents 17% of the sales and 10% of employees of the whole food industry.

Milk is produced in trading companies and cooperatives with farmers like members of them. For the Czech milk production are typical:

- High share of export of raw milk,
- High share of raw milk marketed through marketing organisations,
- Many processors (Agris, 2015)

There are few multinational companies in the Czech Republic that also influence the supply by their price and range of products. According to FAO database the milk production represents the first place on the list of most produced agriculture commodities produced in the Czech Republic in the long term. The milk production also dominates to the export, the raw milk is in top 5 exported commodities of the Czech Republic since the year 2006 till nowadays (FAOSTAT, 2013).

There is a strong competitive environment on the milk and dairy product market. The huge export of raw milk and simultaneously the great import of processed dairy products are typical for the Czech Republic. The Czech farmers export three times more dairy products and raw milk than how many come to domestic market from abroad (IHNEP, 2014).

Another typical feature for the most Czech milk producers is that they run a business on rented land and it caused the increase of production costs. According to the milk Bohemian-Moravian union in year 2012 the 40% from total share of processed milk was in dairy plants of foreign investors. Because of increasing imports of dairy products the production of milk, soured milk products, yoghurt milk, Bifi drinks, acidophilus milk, kefir, creams and butters decreased. On the other hand there was an increase of production of curd, natural cheeses, processed cheeses, condensed milk and dried skimmed milk because of upwarding consumer demand in 2012 (Situační a výhledová zpráva mléko, 2013, p. 5).

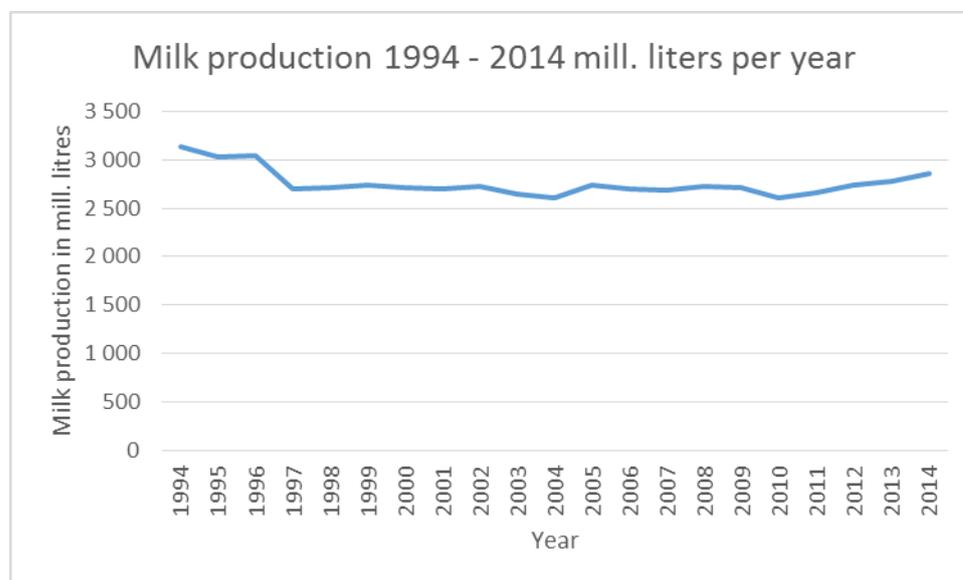
The decline of the domestic milk demand, increase of milk products from abroad and decline of agriculture production in general are typical for this period. It was only question of time when several dairy plants will close down because of their low utilisation of production capacities. This chain of events and therefore the need to secure fair market conditions for dairy farmers in the Czech Republic instigated farmers to establish the first marketing cooperatives (agricultural marketing organisation) in 1995. All important market legislations were written up around year 1995. Numbers from the Report on the

State of Czech Agriculture show that the cows herd dropped by 51% and therefore the production of milk dropped by 44% from 1989 till 1999. The gross agricultural production in 1989 got worsened by 29% till 1999 and the milk production was influenced the most (Ratinger, Bošková, 2013, p. 5).

The trend of the milk production is decreasing in a long term, in 1994 the average milk production per one year was 3 134 millions liters, and in the year 2014 it was 2 856 millions liters, see the graph number 6.

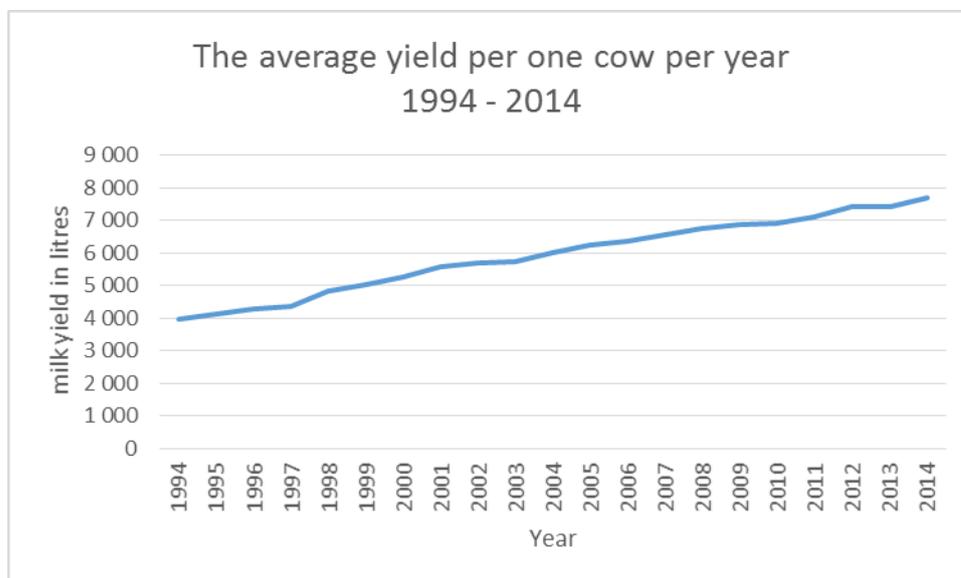
Despite the great cut in number of cows the yield increased very much. The graph number 7 shows the great difference in yield during the years 1994 till 2014, when in present the average yield is 7 705 litres of milk per cow per year, which is comparable with some EU member states. For better imagination in year 1994 it was only 3 964 litres of milk per cow per one year. The rise of yield is the result in incessant genetic research for breeding, feed efficiency as well as the good allocation of subsidies for dairy production (CZSO, 2015).

### Graph No.6: Milk production in the Czech Republic



Source: Author's adaptation according to CSÚ, 2015

**Graph No. 7: The average yield in the Czech Republic per one cow per year, in liters**



Source: Author's adaptation according to CSÚ, 2015

Milk market belongs to agricultural sectors where farmers' cooperatives represent a dominant position. By the word cooperative is meant voluntary organisation that is aimed to obtain economic benefits for its members by means of a common enterprise, mutual cooperation and self-help. The dairy farmer's organisations play an important role in dairy industry since 70% of milk sales are coming from them. Traditional agricultural marketing cooperatives endeavour to strengthen the position of farmers by gaining of market information and collecting, selling and processing agricultural commodities (Ratinger, Bošková, 2013, p. 1).

The rapid change in 90s was accompanied by increase of input prices into agriculture while the output prices did not grow with the same pace. This above mentioned abandoning of several domestic agricultural suppliers and foreign direct investment, when foreign suppliers offered inputs for higher prices, caused the increase of input prices. Up to entrance to EU common market in 2004 offered new development opportunities and the dairy market was relatively stable, nevertheless the decrease of dairy farms under the milking control was recorded, from former 4224 dairy farms in 2000 to only 1789 in 2010

which represents drop by 58%. The process of the primary production enabled to stay on the market only the most competitive farms (Ratinger, Bošková, 2013, p. 5).

The quality of the Czech milk is very good in a long term. Approximately 96.5% of Czech milk belongs to the best quality. The dairy plants make individual contracts with their agricultural suppliers and they very often pay extra money for additional special properties such as more proteins. The import of milk products to the Czech Republic is not necessary, since the most of those products are possible to produce here in better quality, however the import represents 40% of Czech domestic consumption. The average Czech consumed 236.4 kg of milk and dairy products per one year in year 2014 (Náš chov, 2015).

The decreased supply of milk and dairy products, lowered purchasing power and shifting consumer preferences were main factors that caused decrease of milk consumption in the Czech Republic. However the consumption of milk in the Czech Republic is still in surplus, the production is 2.8 billions of liters per year and the consumption is 2.3 billions of liters per year. The consumer's behaviour has changed to low-fat and long-life products. In 1998 the liquid milk market consisted by 53% more of those products compared to 1997 which represented 25.7% of the liquid milk market. The consumption of butter was partially replaced by vegetable fats (A Study of the Milk Sector in Poland, Hungary, the Czech Republic and Estonia, 2007, p. 11).

The share of exported milk and dairy products on total agrarian export in 2012 represented 11.2%, which implies that milk and dairy products are the strongest commodity in in agrarian export. The percentage share on total agrarian export was even better before year 2012 that is shown in table number 4.

**Table No. 4: The share of milk and dairy products on total agricultural export (in mill. CZK)**

Indicator / Year	2006	2007	2008	2009	2010	2011	2012
Export	78 532.8	96 718.4	102 877.5	99 207.7	100 389.2	108 326.4	138 080.4
Share in %	15.1	15.5	13.5	11.8	12.4	13.6	11.2

Source: Author's adaptation according to Situační a výhledová zpráva mléko p. 67

The development of Czech international trade with milk and dairy products got worse. The reasons are low prices of dairy products abroad in long term as well as appreciation of Czech crown, that caused lower realized export price. The import of dairy products to the Czech Republic is still increasing (Doubek, 2006, p. 3).

### **4.3 The situation of dairy sector on the Czech market**

Milk production belongs to the main agricultural branches in the Czech Republic. According to numbers from the Czech statistical office the agrarian balance of international trade with Czech dairies is since the year 2009 negative. For the imagination the balance in year 2000 was 4 billions positive and in year 2013 was one billion negative (Agris, 2015).

The development of situation in milk sector is influenced by European as well as by World market due to expanding globalisation. The prices of the milk market are determined by giant and strong supranational companies. The price of raw milk and dairy products in the Czech Republic is influenced by internal factors on domestic market as well as by development of milk and dairy products on the world market. There are many supranational companies in the Czech Republic that also influence the price of milk. The milk production opportunities in the Czech Republic are affected by imports of dairy products from European countries such as Germany, Belgium, Poland and by import to neighbouring Bavaria and Saxony where the milk is processed and the final product is again imported to the Czech Republic (Situační a výhledová zpráva mléko, 2013, p. 6).

The European Commission predicted that in period 2014 – 2024 the production of Czech raw milk will drop down, the reason is that other European countries such as Denmark, Germany, Ireland, France, Netherlands will increase their milk production but the most influential for the Czech Republic will be situation in Poland, where the huge investments will decrease production costs (Francová, 2013).

### **4.4 The situation on the Czech – German dairy market**

Two German dairy plants situated near to the Czech borders and other close countries extended their procurement to the Czech Republic in 2010 and foreign direct

investment contributed to the domestic dairy industry as well as to better efficiency of the production since the products from Czech raw milk expanded on the market. The first investors in the Czech Republic were the Bongrain S.A. and the Danone group, they were followed by the Lactalis group, the Müller A.G., the Brazzale S.p. and the Bel group (Ratinger, Bošková, 2013, p. 6).

The Czech companies joined to each other to be more competitive against these world companies and to increase their efficiency and share on the market. For instance the companies Moravia Lacto, plc., Mlékárna Olešnice RMD and Bohemilk, plc. created together InterLacto. Also OLMA, plc. and Mlékárna Hlinsko joined to company AGROFERT HOLDING, plc. (Špička, 2013, p. 8).

According to Gray et al. (2011) there are three main methods how to improve the productivity in the dairy industry: the technical change, structural adjustment and changes in the technical efficiency. All those methods have one common feature which is crucial for better competitiveness and it is an innovation strategy (Špička, 2013, p. 1).

Because of abolishing of milk quotas the production of raw milk increased in Germany due to this new situation. Germany is the most important international trade partner on both sides on export and as well as on import in 2012. As it is indicated in table number 5, Germany significantly outnumbers the other countries, the share of Germany on total import of milk and dairy products is 42% and its share on total export is 29%. Germany is a dominant importer of dairy products into the Czech Republic. German dairy market faces to low purchase price of milk nowadays. There is a surplus of milk in German supermarkets, the cheapest one liter of milk costs 55 cents in supermarket thereof producers get 28 cents, for comparison in 2014 the producers got 40 cents. The German union of milk producers is convinced that one of the main reason is Russian embargo on food coming from states that agreed with sanctions on Russia (Ekonomický deník, 2015).

**Table No.5: Top five countries, where the milk and dairy products are exported and imported to the Czech Republic in 2012 (in mill. CZK)**

Export			Import		
Country	Value in mill. CZK	Share from total export	Country	Value in mill. CZK	Share from total import
Germany	4 465.8	29%	Germany	4 706	42%
Slovakia	2 709.4	17.6%	Poland	2 989.6	26.6%
Italy	2 092.8	13.6%	Slovakia	1 488.6	13.3%
France	631.9	4.1%	France	550	4.9%
Poland	609.1	4%	Netherlands	340.4	3%

Source: Author's adaptation according to Situační a výhledová zpráva mléko, 2013, p.68

In 2013 the most of milk and dairy products were as traditionally imported from Germany (42.7%), than to Poland (26.7%) and Slovakia (13.2%), that stand for 82% of total import of milk and dairy products to the Czech Republic in 2013 (from the economic point of view). Both import as well as export of milk and dairy products are constantly increasing and the balance continues to be positive (Situační a výhledová zpráva mléko, 2013, p.66).

If we compare data from tables number 6 and number 7 we can see that export of dairy products is exceeding import in most of cases, however there is a great excess of import of cheeses and butter over export. The situation with yoghurt and kefir is almost balanced. The major importer of yoghurts in 2012 was Germany 49.1%, regarding to Kefir the most of this product was again imported from Germany 54.9%, than from Poland 28.9% and from Slovakia 11.7% (Situační a výhledová zpráva mléko, 2013, p.73).

**Table No.6: Structure of export of dairy products in 2004 – 2012, the share of products from total dairy products in %**

Product/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Powdered milk	36.2	27	15.7	18.4	14.8	10.6	11	12.2	11.9
Cheese, curd cheese	19.5	17.8	15.3	11.9	14	16.1	19.1	20.9	22.3
Butter	12.6	8.2	9.2	8.6	6.8	6.6	4.4	3.1	2
Condensed milk	3.4	2.3	1.7	1.3	1.5	2.2	2	1.7	2.2
Yoghurt, Kefir	5.8	8.4	12.1	12.7	14.1	18.7	14.9	12.6	11.6
Liquid milk, cream	18.4	32.4	41.8	41.8	45.4	42.9	43.5	43.7	42.7
Whey	4.1	3.9	4.2	4.2	3.4	2.9	5.1	5.8	7.3

Source: Author's adaptation according to Situační a výhledová zpráva mléko, 2013, p.67

**Table No.7: Structure of import of dairy products in 2004 – 2012, the share of products from total dairy products in %**

Product/Year	2004	2005	2006	2007	2008	2009	2010	2011	2012
Cheeses in total	55.3	53.7	54.3	51.1	53.3	55.6	57.5	57.8	57
Yoghurt, Kefir	16	14.6	12	11.3	11.6	11.2	10.6	10.5	11
Liquid milk, cream	17.1	17.4	15.4	14.8	16.6	13.3	9.7	10.4	11.6
Condensed milk	1.5	1.8	1.2	1.8	1.1	1.2	1.1	1.1	1.1
Powdered milk	2	1.3	2.4	2.7	1.7	1.6	2	1.4	1.1
Butter	6.5	9.6	12.5	14.1	13.8	15.6	16.7	16	14.5
Whey	1.6	1.6	2.2	4.2	1.9	1.5	2.4	2.8	3.7

Source: Author's adaptation according to Situační a výhledová zpráva mléko, 2013, p.67

The share of imported dairy products to the Czech Republic had increased last few years. The imported products are coming mostly from Germany, Finland and Poland. The import share of the consumer milk and cream has increased rapidly, however its share of consumption is about 7% which is not significant number. In spite of the fact that the import of dairy products is rising up, it does not impede Czech producers currently.

The year-on-year growth of import was monitored also by yoghurt and other soured milk products, that were again predominantly imported from Germany. The biggest importer of cheese Edam in 2012 was again Germany, it was approximately 12.9 thousands tonnes for average price 73.25 CZK/Kg. Data from the Czech statistical office say that Camembert was predominantly imported from Poland (4.5 thousands tonnes) and Gouda from Germany (3.5 thousands tonnes). Another important imported items from milk

and dairy products are natural cheeses and curd cheese, when most of them came from Germany (14.4 thousands tonnes) in 2012 (Situační a výhledová zpráva mléko, 2013, p.74)

The structure of export of milk and dairy products is quite dynamic. During the time scale 2004 – 2012 was monitored downswing of export by almost all dairy products. The export of cheeses, curd cheeses and whey increased slightly. The high export remains only by liquid milk (which is a raw material which means with low value added).

The situation regarding to import and export of milk and cream, not concentrated nor containing added sugar or other sweetening matter is recorded in the table number 8. The numbers from statistical database Comtrade show the fact, that both import and as well as export of milk and cream are increasing year after year and the significant growth was monitored after year 2004, when the Czech Republic become a member state of the EU. According to data is evident, that export of milk and cream exceeds import considerably. The trade value of export in year 2015 was 190,509,683 US\$, whereas trade value of import was compare this numbers only 12,731,248 US\$. This confirms previous statement about export of Czech milk with to Germany.

**Table No.8: Import and export of Milk and cream, not concentrated nor containing added sugar or other sweetening matter**

Year	Import		Export	
	Trade value (US\$)	Weight in kg	Trade value (US\$)	Weight in kg
2015	12 731 248	14 676 990	190 509 683	541 591 233
2014	25 754 384	24 117 407	267 598 505	512 628 971
2013	26 062 959	27 280 348	219 877 356	430 678 026
2012	28 165 153	35 369 618	203 990 116	473 392 542
2011	23 238 702	20 780 563	226 609 657	429 317 868
2010	15 998 125	14 746 873	182 835 268	401 929 905
2009	16 288 052	15 402 223	164 377 418	440 172 262
2008	18 064 078	13 333 712	256 920 257	465 381 514
2007	14 474 851	11 694 464	206 221 102	425 041 952
2006	10 021 131	10 285 836	156 869 436	413 996 100
2005	7 832 017	10 451 166	109 153 856	268 169 576
2004	3 409 676	3 721 423	26 191 707	39 307 494
2003	1 827 237	1 117 705	355 113	240 816
2002	1 163 821	792 820	1 024 358	816 760
2001	876 195	654 315	252 233	249 103
2000	1 108 904	802 840	9 088	8 392

Source: Author's adaptation according to Comtrade, 2016

The other side of dairy trade between the Czech Republic and Germany is shown in Annex number 1, that is devoted to import and export of certain dairy processed products. It is the problematic part of the dairy trade between those two countries. In previous table is shown dominant export of milk and cream to the Germany, however concerning to processed products the import exceeds export in every cases. There are huge differences, import of cheeses and curds prevails export in a long term, in year 2015 the trade value of imported cheeses and curds was 121,951,414 US\$, while the trade value of export in the same year was 11,609,326 US\$. The same story is with import and export of yogurt, buttermilk, curdled, fermented or acidified milk and cream, ice – cream, when import is much higher than export and this situation pays also for import and export of butter. The import of dairy products with higher value added is enormous and not in balance with export of milk and cream. The amount of imported and exported dairy products grows annually.

## 4.5 Major Czech dairy producers

The biggest dairy companies according to annual turnover are Madeta, Pragolaktos, Olma and Hlinsko. Under French company Lactalis, it is also dairy plant Kunín and under concern Agrofert, dairy plants Orrero and Klatovy (Veselá, MZE, department of commodities of cattles and feed).

### 4.5.1 Madeta



Figure No.1: Logo of Madeta, (Madeta 2013)

Madeta is regarded for the largest dairy plant in the Czech Republic. The company is based on long term tradition, which evidences original recipe and the quality of dairy products is 100% natural, without preservatives.

Madeta was established in 1902 under the name MLÉKÁRENSKÉ DRUŽSTVO TÁBORSKÉ in the city Tábor. In 1913 was Madeta the biggest dairy manufacturer in

Bohemia. In 1945 was Madeta the official name of the dairy plant, it is abbreviation of first letters of previous name MLÉKÁRENSKÉ DRUŽSTVO TÁBORSKÉ. The nationalization of this dairy plant happened in 1948 and 12 years later was developed a company Jihočeské mlékárny, where belongs also Madeta. In 1992 was initiated a restructuring and concentration of production. In 2002 was renamed into Madeta plc. (public-limited company).

The dairy plant company consists of five separated facilities that are developing only from the Czech capital. They produce more than 250 kinds of dairy products, that represents an annual volume of 396 900 000 products. These facilities are situated in Český Krumlov, Jindřichův Hradec, Pelhřimov, Planá nad Lužnicí a Řípec. Every facility produces its own special products, in which they are the best. Plant in Řípec is focused on production of processed cheeses such as Jihočeské Lipno, Madetka, Primator etc. Dairy in Planá nad Lužnicí started to work in 1968 and is specialized in Southbohemian butter and Southbohemian spread butter, Madeland and white cheeses like akawi and Balkan cheese. Dairy in Jindřichův Hradec is very good for production of milk desserts Lipánek, cheese romadur that matures under frost. The most up-to-date technologies for production of long-life milk is in Pelhřimov. The biggest production of blue cheese “niva“ with annual 2000 tonnes is located in Český Krumlov.

Approximately one fourth of the production is exported abroad such as Lebanon, United Arab Emirates, countries of the European Union, Russia, Asia, Africa and America. All products from Madeta have the label Czech product, that is granted for 3 years and products with this label have to have exact share of Czech ingredients and processing in the Czech Republic. The blue cheese niva is labeled by Protected designation of origin. Assortment from Madeta is very broad, from milks, creams, butters, spread butters, yogurts, curds, fermented milk drinks, desserts, fresh cheeses, processed cheeses, natural and white cheese to mould-ripened cheeses. Madeta is constantly adapting to customers needs. They produce dairy products with low content of lactose, they provide catering service, bistro and also e-shop, where is possible to buy their products (Madeta, 2013).

#### 4.5.2 Kunín



Figure No.2: Logo of Kunín, (Mlékárna Kunín, 2015)

History of dairy company Kunín started in 1945, when was initiated building of milk cooperative. It was at the same time, when there was passing a war front and therefore the construction was prolonged and dairy plant was opened one year later. During nationalization and its reorganization was Kunín dairy integrated into Silesian dairy company (Slezské Mlékárny) and later into Beskydy dairy company (Beskydské Mlékárny). After privatization became Kunín dairy plant again independent. In 2007 got Kunín dairy plant a new majority shareholder, it is the second biggest dairy company in the world, French company Lactalis. Dairy products from Kunín are exported to Hungary, Poland, Italy, Slovenia, Romania, Lithuania, Latvia, Estonia, Finland and Sweden. Production offers butter, cream, milk, yogurt, fermented milk drinks and desserts (Mlékárna Kunín, 2015).

#### 4.5.3 Olma



Figure No.3: Logo of Olma, (Olma, 2016)

Olma dairy plant is solely Czech company, with absolute owner AGROFERT<sup>1</sup>.

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<sup>1</sup> AGROFERT is a large concern established in 1993 by A. Babič with only 4 employees with specialization on trade with fertilizers. In course of the time its interest was extended into more 250 subjects from branches such as chemistry, agriculture, food industry, forestry, lumbering, land technology, transportation, renewable resources and media. AGROFERT is currently a supranational company.

The construction of dairy company Olma began in 1967, when 14 dairy companies in its surrounding were closed and employees of these dairy plants were main labour of Olma. Two years later was initiated operating with technologies from traditional dairy developer countries such as Tetra Pak from Sweden, Elopak from Finland or Simon from France. Olma became a part of North Moravian dairies (Severomoravské mlékárny NP Ostrava - Martinov). Also its name is an abbreviation of first letter of cities Olomouc and Martinov. In 1994 was Olma privatised and was established a public-limited company. In 90s the investments were used for environmental issues, mainly for sewage disposal plant. Before 2000, Olma produced the most long-term milk in its history, it was exactly 300 000 liters per one day, however in 2012 was production of durable milk completely stopped and replaced by production of fresh milk. Olma was in 1998 the first dairy company in the Czech Republic, that produced 6 000 liters of long-life milk per one hour. AGROFERT is a new major owner of Olma since 2008 (before it the major owner was Milkargo Olomouc). Products from Olma are fresh milk and cream, fermented milk drinks and yoghurts, desserts, curd cheese, butter, vegetable fat, spread butter and milk powder (Olma, 2016).

#### 4.5.4 Hlinsko



Figure No.4: Logo of Hlinsko dairy plant, (Tatramleko, 2016)

Dairy plant Hlinsko was founded in 1939 and entered into operation in 1943. At the beginning were processed 2 million liters of raw milk for production of milk powder, condensed milk, butter and buttermilk powder. Since 1970 Hlinsko dairy company is producing almost 200 million liters of milk every year and its production was extended by long-term milk, cream, ice cream and crushed ice. In 2015 Hlinsko company launched on the market curd cheese with a logo Tatra. Export started already in 1947 and currently they export 50% of their production into more than 25 countries. Products from Hlinsko dairy plant are sold under brand Tatra and this logo is used since 1964. AGROFERT is the main

owner of Hlinsko dairy plant since 2011 and was transformed into public-limited company (Tatramleko, 2016).

#### 4.5.5 Pragolaktos



Figure No.5: Logo of Pragolaktos, (Pragolaktos, 2015).

The predecessor of dairy company Pragolaktos was established in 1870 in Prague Hostivice.<sup>2</sup> Another dairy plants were founded in the course of the time in Prague and it period 1945-1948 were nationalized. In year 1953 was established Prague dairy trust that included all dairy companies in Prague and Middle Bohemian region. All those dairy companies merged and created one company Laktos. This dairy plant was in 1989 divided into 13 state companies, that were privatized in 1992 and therefore dairy plant Pragolaktos has been established. Since 2010 is Pragolaktos in 100% ownership of Sachsenmilch Leppersdorf GmbH, that belongs to German dairy company Müller. Pragolaktos is specialized on production of long-life milks and creams and both also with lower content of lactose (Pragolaktos, 2015).

#### 4.5.6 Orrero



Figure No.6: Logo of Orrero, (Orrero, 2014)

Orrero plc. is a company where have met a high quality Italian technology and Czech agricultural quality. Orrero is nowadays the largest cheese factory in the Czech Republic and its share of total export of all cheeses from Czech Republic is one third. All cheeses are produced according to an Italian tradition. Approximately 95% of cheeses are

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<sup>2</sup> It was the oldest industrial dairy plant in Bohemia.

exported, which represents a huge benefit for Czech economy. The annual turnover of Orrero cheese factory was two billions of Czech crowns in year 2013 and 1.6 billions of Czech crowns came from export. Two thirds of Orrero's production lies in the production the cheese Gran Moravia. Besides this famous cheese, the Orrero offers cheese Verena, scamorza, ricotta, mozzarella, caciotta and other products from a factory shop La Formaggeria Gran Moravia, that are currently 15 in the Czech Republic. Orrero plc. does not produce only cheeses, but also yogurts, whey, butter and fermented milk drinks.

History of Orrero cheese factory is dated to 1995, when Mrs. Marie Martinů, living in Italian city Modena in a region of production of cheese Parmigiano Reggiano, has decided to built similar craft cheese factory, that are in Italy. The headquarters of the company is in Litovel. The experiences, skills and tradition were implemented by an Italian family Brazzale in 2000.<sup>3</sup> New technology was installed and in 2003 started a production of cheese Gran Moravia. Manufacture started with processing of 6 000 liters of raw milk per day and has increased to 450 000 liters per day, which places the Orrero cheese factory on the 5<sup>th</sup> position regarding to amount of processed milk in the Czech Republic. About 95% of cheese Grand Moravia mature in Italy and it is exported into more than 50 countries. The rest 5% mature in the Czech Republic for Czech consumers. The Brazzale company is very focused on protecting of environment and therefore the Orrero has to keep and fulfill very strict conditions concerning to environment as well as an animal welfare. In year 2012, the Orrero cheese factory became the first company that have calculated a waterfootprint of cheese Gran Moravia <sup>4</sup> (Orrero, 2014).

## **4.6 Major German dairy producers**

In the table number 9 are shown the 10 best dairy companies in the Germany in year 2014 according to their turnover in millions Euros.

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<sup>3</sup> The cheese factory of family Brazzale was established in 1784, when the 7<sup>th</sup> representative of this business family has decided to transfer all the family production to the Moravia. It was very risky step, however nowadays the Orrero cheese factory is the largest cheese factory for production of hard cheeses in the world.

<sup>4</sup> Waterfootprint shows how much water was used in all production process, from raw material till final product.

**Table No. 9: Top 10 dairy companies in Germany**

Ranking	Dairy company	Turnover in Germany 2014 in millions €
1	DMK Deutsches Milchkontor	3 180
2	Theo Müller*	1 600
3	Arla Foods*	1 550
4	FrieslandCampina*	1 370
5	Hochwald Foods	680
6	Bayerland Gruppe	630
7	Hochland	580
8	Savencia*	500
9	Meggle	434
10	Zott*	425

Source: Author's adaptation according to Milchindustrie-Verband e.V., 2014

\*estimated

#### 4.6.1 Müller



Figure No.7: Logo of Müller, (Müller, 2016)

German dairy plant Müller is the copybook example, when Czech raw milk is exported from the Czech Republic and comes back from Germany in a form of processed dairy product with higher value added. Müller has already 3% share of yogurt market in the Czech Republic. The status one of the biggest dairy plant in the Europe is provable by numbers, when approximately 4500 tonnes of raw milk is processed every day, which means 1.6 millions tonnes every year and 15% of this raw milk originate from the Czech cows. There are working 1700 people in non-stop operation.

Products from Müller are in the long term in a front position on the market of Western Europe such as Germany, Great Britain and Italy. Müller dairy plant is only one

important producer of milk products that use fruits that is not processed by supplier in advance, but the company processes the fruit with its own capacity. The company is one of the three biggest processor of fruits in the Europe and strives to keep original properties of fruit such as taste, smell and texture. Another advantage of Müller is constant improving and innovation of their products that became an inspiration for another milk companies.

The Müller company was established in 1896 by Ludwig Müller in the village Aretsried in Bavaria. In 1970 started a large advertising campaign, development of distribution chain and many innovations in processes and products. Ten years later they started to produce their own packages (Optipack) and logistic chain (Culina). During the period 1987 and 2000 entered on British and Italian market and acquisitioned some dairies in Leppersdorf and Weihenstephan. In 2007 initiated joint venture in Romania, Izrael and Bulgaria. In 2009 entered into Czech, Slovakian and Polish market. In 2010 came to pass to acquisition of Czech dairy company Pragolaktos. The latest event was in 2012, when Müller entered into American market, jointed with brand Pepsi Co. And created together a brand Müller Quaker (Müller, 2016).

#### 4.6.2 DMK Deutsches Milchkontor



Figure No.8: Logo of DMK, (DMK, 2015)

DMK Deutsches Milchkontor belongs among leaders of milk sector in Germany as well as in Europe with annual turnover of 5.3 billion euros. There are more than 8 900 active milk producers, who deliver 6.8 billion kilos of milk every year to DMK. The production is divided into 26 locations in 10 different German north-western regions, where are working around 7 400 people. It is extended from the Danish to the Czech borders in Bayern, Baden-Württemberg, Thüringen, Sachsen-Anhalt, Brandenburg, Mecklenburg-Vorpommern, Schleswig-Holstein, Niedersachsen, Nordrhein-Westfalen and Bremen.

DMK company was established in 2011 by merger of Nordmilch and Humana. The offer with milk products is very wide, they provide basic milk products, cheese, fresh dairy

products, (fresh milk, UHT milk, curd, butter, cream, desserts, mascarpone) and dairy ingredients for food manufacturing to baby food, ice cream, health products and special animal feeds. Their products is possible to purchase under brand names such as as Milram, Ravensberger, Osterland, Oldenburger, Humana, Intact, Leben's, Biolabor, Casarelli, Golden cheese and Normi. DMK has also the Milk innovation centre with experimental kitchens and analytical laboratories, where are good conditions to develop new products, that will meet world challenges (DMK, 2015).

#### 4.6.3 Arla



Figure No.9: Logo of Arla, (Arla Foods, 2015)

Arla is not exclusively German dairy company, because it is owned by farmers, who produce milk in few European countries. This is company's benefit, because they can ensure a high quality of the milk and they guarantee, that the milk is natural, nutritious and handle by sustainable way. Farmers have to keep very strict standards. Profit from Arla purchase goes directly back to the farmer. There are 15 farmers on the Arla's Board and the Board of Representatives consists from 179 farmers. Arla dairy plant works on principle of cooperative model, which means, that farmer are together in every occasions, they share profits and losses from the market.

Arla dairy company's history is dated since 1881, when milk farmers in Denmark and Sweden created small cooperatives. Together they were stronger and could invest equipment and made better quality products. The profit was equally divided among all farmers. There was a geographical progress, when they spread from local to regional and to national cooperatives. In year 2000 was established the first cross national merger in the Nordic dairy sector. This idea got abroad, to the Netherlands, Germany, Belgium and Luxembourg.

In 2011 Arla and German Hansa-Milch eG merged and 670 German farmers became cooperative owners of Arla Foods a.m.b.a. One year later Arla United with the German dairy company Milch-union Hocheifel MUH. The 10% of the Arla's turnover goes for product development, they collaborate with universities, research organisations

and suppliers with the aim to innovate their products and continue with constant improvement. The Arla's assortment is very large and offers a wide range of dairy products (Arla Foods, 2015).

#### 4.6.4 Hochwald foods



Figure No.10: Logo of Hochwald, (Hochwald, 2016)

The production of Hochwald dairy company started in 1932 in Thalfang in Rheiland –Pfalz, that time under the name cooperative Erbeskopf eG. Manufacturing was initiated with butter and three years later extended by coffee cream, sour cream and condensed milk. In year 1953 was founded subsidiary Hochwald-Milchwerke GmbH. In course of the time, the company constructed its own a canning factory for condensed milk production in Thalfang and slaughterhouse<sup>5</sup>. In 1986 was realized merger with Pfalzmilch eG and acquired the plant in Kaiserslautern. Since 2001 there have been many merger with Eifelperle Milch eG, Hillesheim, with the plant in Erftstadt and Starmilch eG in Fulda. Also the name of cooperative was changed into Erbeskopf Eifelperle eG. In 2012 was Erbeskopf Eifelperle eG and Hochwald Nahrungsmittel-Werke GmbH renamed to Hochwald Milch eG and Hochwald Foods GmbH.

The milk suppliers come from Germany and Austria and except of the domestic sale, they export their products abroad, mainly to the Middle East. The assortment of Hochwald is from condensed milk, coffee cream, long-life milk and milk-mix products, fresh dairy products, whipped cream, spreads to deserts and cheeses (Hochwald, 2016).

#### 4.6.5 FrieslandCampina



Figure No.11: Logo of FrieslandCampina, (FrieslandCampina, 2016)

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<sup>5</sup> The Hochland is focused also on slaughter of cows and pigs and than sells sausages and canned sausages

FrieslandCampina is a global company with major base in the Netherlands, Germany and Belgium with a focus on local communities and consumers. It is also active in some countries in Asia, Africa and the Middle East. Their products is possible to purchase in 100 countries in the world and it gives to FrieslandCampina status one of the six largest dairy companies in the world.

Nine farmers in Netherlands wanted to have more power on the market and to deliver milk to customers as soon as possible and therefore they have established in 1871 cheese local factory in the Dutch Wieringerwaard. In 1880 was founded first dairy cooperative. The Campina brand was introduced in 1947. In year 1993 was carried out an acquisition of Südmilch and in 2001, Campina merged with the Milchwerke Köln/Wuppertal cooperative from German city Cologne. In 2008 Royal Friesland Foods and Campina merged and created Royla Frieslandcampina. FrieslandCampina regards innovations of products for an important part of their strategy and therefore their innovations teams, who are working for better products in research and development and innovations centres. There are many different brand that are selling products under FrieslandCampina, the most well known in Germany is Landliebe (FrieslandCampina, 2016).

#### **4.7 Czech dairy sector after EU accession**

The Czech Republic entered to the European Union on the 1<sup>st</sup> May 2004 and the Common Agricultural Policy (CAP) was applicated at the same time. It meant, that all food industry and therefore also dairy companies had to adapted to strict hygienic and technical standards of the European Union within harmonised food processor legislation. The purpose was to ensure a healthy sanitarness of food and consumer protection. All Czech dairy companies fulfilled these hygienic criterias and they are certificated for entrepreneurship within all the European Union. On the other hand, a difficult fight for the position on the market and fight for the customer began for the companies on the dairy sector because of the global and very competitive market. The Czech Republic faced structural and political changes after the World War II, that had an impact on harmonisation with the European Single Market. The trend of agricultural production is decreasing and this fact influenced the Czech position during bargaining about integration

of the Czech agriculture into the CAP and conditions of Czech farmers were not satisfied (Kučerová, 2005, p. 1).

The problem is still decreasing number of cows, as you can see in table number 10 from the beginning of EU membership the number of milk cows in 2004 which represented 429 300 decreased to 372 390 in 2014. However it is not a significant change because the milk yields are high enough and compensated number of cows.

The positive balance of foreign trade was accomplished at milk and milk products in the recent years. A considerable contribution this favourable balance is coming from Germany. There are opportunities to export raw milk to German milk factories and also to export milk products with higher value added (special cheese) to Middle East countries.

**Table No. 10: Number of milk cows after EU accession**

Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Number of milk cows in thousands	429.3	437.1	417.3	407.37	399.67	383.82	375.38	374.07	357.07	375.33	372.39

Source: Author's adaptation according to Eurostat, 2015

Within the EU accession the Czech Republic had to accept a customs legislation of the EU including tariff scale and political measures. The State agricultural intervention fund is responsible for administration measures on the milk and dairy market within the common EU market, it accepts applications, makes contracts, controls if all conditions are fulfilled, makes payments and administration with milk quotas etc. The State agricultural intervention fund pays European grant programmes and national grant programmes. The main grants programmes in the Czech Republic are The rural development programme, SGAFF (supportive and grant agricultural and forest fund) etc. (Situační a výhledová zpráva mléko, 2013, p.16).

The advantage from the EU's support is that there is the United payment for agricultural land. Farmers can better adjust to the demand and decide, what they would like to produce regardless of what they are producing. To receive this support farmers have to own at least 1 hectare of agricultural land in total. The charge for year 2013 was 6 068.88 CZK per one hectare. The amount of grant is increasing with every year, which is very positive for farmers (Situační a výhledová zpráva mléko, 2013, p.18).

There are different value added taxes rates (VAT) in European Union member countries. In table number 10 you can see the VAT for milk, in most of the countries the value added rate is same for all basic foodstuffs, but in Ireland is the rate 0% for milk, tee, coffee and bread. In Croatia 5% is for milk and bread. The rate for basic foodstuffs in the Czech Republic is 15%, however in neighbouring Germany it is only 7%, which can also play a significant role in final price of the product. According the numbers it is obvious, that most of EU member countries have lower VAT for basic foodstuffs than the Czech Republic.

**Table No. 11: VAT for basic foodstuffs in EU countries in 2015**

Country	VAT (%)	Country	VAT (%)
Austria	10	Ireland	0
Belgium	12	Italy	4
Bulgaria	20	Latvia	21
Croatia	5	Lithuania	21
Cyprus	5	Luxembourg	3
Czech Republic	15	Malta	0
Denmark	25	Netherlands	6
Estonia	20	Poland	5
Finland	14	Portugal	13
France	5.5	Romania	9
Germany	7	Slovakia	20
Great Britain	0	Slovenia	9.5
Greece	13	Spain	4
Hungary	18	Sweden	12

Source: Author's adaptation according to Taxud, 2015

## 4.8 Price development

Volatility is a common characteristic of agricultural markets. In 2014 was monitored a significant price decrease due to increase of milk demand in the EU as well as worldwide. The price is not determined by producers however by market. The

competitiveness of the EU on the world dairy market was influenced by appreciation of Euro towards American dollar. To keep a stability on EU's dairy market and as well as on Czech market it is important to keep the competitiveness on the world market and to be able to deliver milk to the Third countries (European Commission, 2015).

The price of milk is influenced by many factors such as the development of international market with milk, the size of dairy farming and the quantity of certain constituents. The amount of fat in milk is decreasing in the Czech Republic, whereas the amount of fat in Germany is higher and therefore the dairy plants in Germany pay more to suppliers. The trade possibilities were negatively influenced by the economic crisis in Russian and Ukraine in the autumn of 1998 (A Study of the Milk Sector in Poland, Hungary, the Czech Republic and Estonia, 2007, p. 13).

The Czech Republic has lately surpluses of milk and therefore its price is dropping. The problem is that Czech dairy plants are under the pressure from retail chains that require low prices. The dairy plants are not able to produce products for such a ridiculously low prices and therefore are under risk that they will be removed from the shelves. The copybook example is case with Madeta. The retail chain Kaufland demanded from Madeta to supply cheaper products and because it was not in Madeta's competency, its products were recalled in 2015. The consequence was that Madeta had to process in addition 200 000 liters of milk per one week, usually in form of powdered milk or long-life milk that is losing for Madeta. When the retail chains do not get what they want from the producers, than they change the Czech products for cheaper products from abroad. The supply of milk and dairy products in Germany is stronger than demand because of milk quotas ending and market liberalization and therefore the dairy products are now cheaper (IHNEDE, 2015).

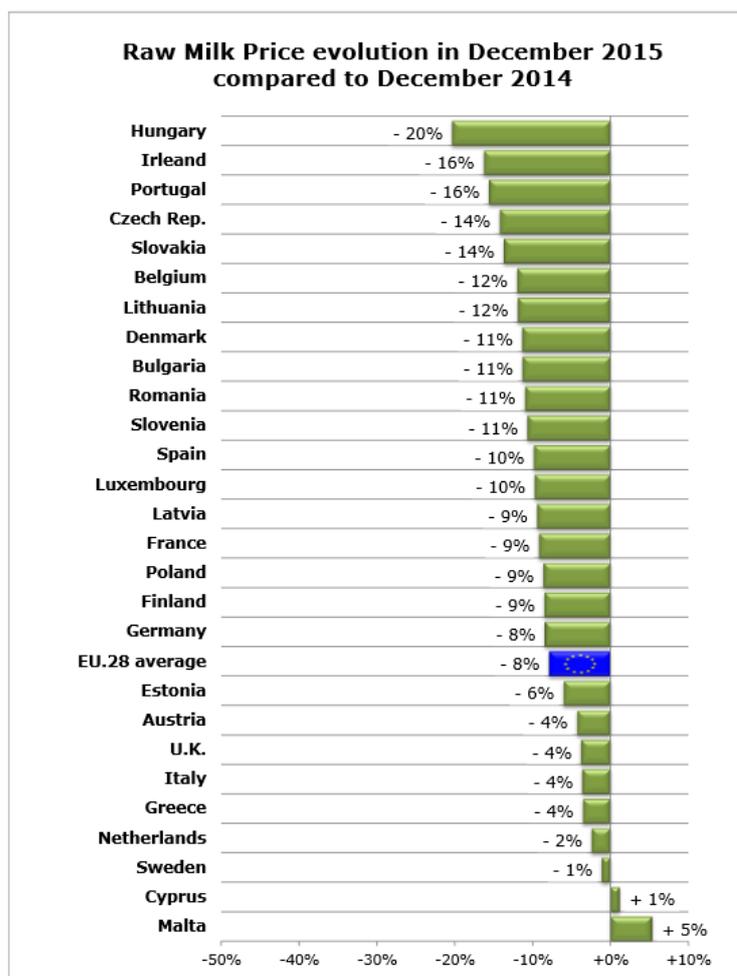
The decrease of milk price begun in recent times with milk and dairy products embargo to Russia<sup>6</sup>, like a reaction on the situation and also retaliation against European sanctions over Ukraine and Crimea. The sale of Czech milk was not so good like years before and it caused overproduction and also milk and dairy products from different

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<sup>6</sup> Russia has imposed embargo on some agriculture products and foods (dairy products, meat, fishes, vegetable, fruits, nuts etc) in a reaction to sanctions, that were imposed by EU, because of the situation regarding to Crimea crisis in 2014. Embargo was imposed on countries of the EU, on U.S., Australia, Canada, Norway, Albania, Montenegro, Lichtenstein, Iceland and since 1<sup>st</sup> January 2016 on Ukraine.

countries came to the Czech Republic, more because the embargo from Russian was imposed also on them. The slump of raw milk prices is shown in graph number 8, the price difference is captured in year 2014 and 2015. The EU's average price change in this period is -8%. Prices in the Czech Republic dropped by 14% and in Germany by 8%. There are only two countries, where the prices of raw milk have increased, in Malta and in Cyprus. The price of milk in the Czech Republic is the 5<sup>th</sup> lowest within the EU and on the other hand the price of some dairies are the higher than EU average. For instance the price of butter in the Czech Republic is by 6% higher than its neighbouring countries. Despite these facts there is a pressure on Czech milk producers from the EU to decrease price of raw milk if the prices would drop down than the flow of investments would slow down or even stop which would lead to increase of Czech competitiveness (Agris, 2015).

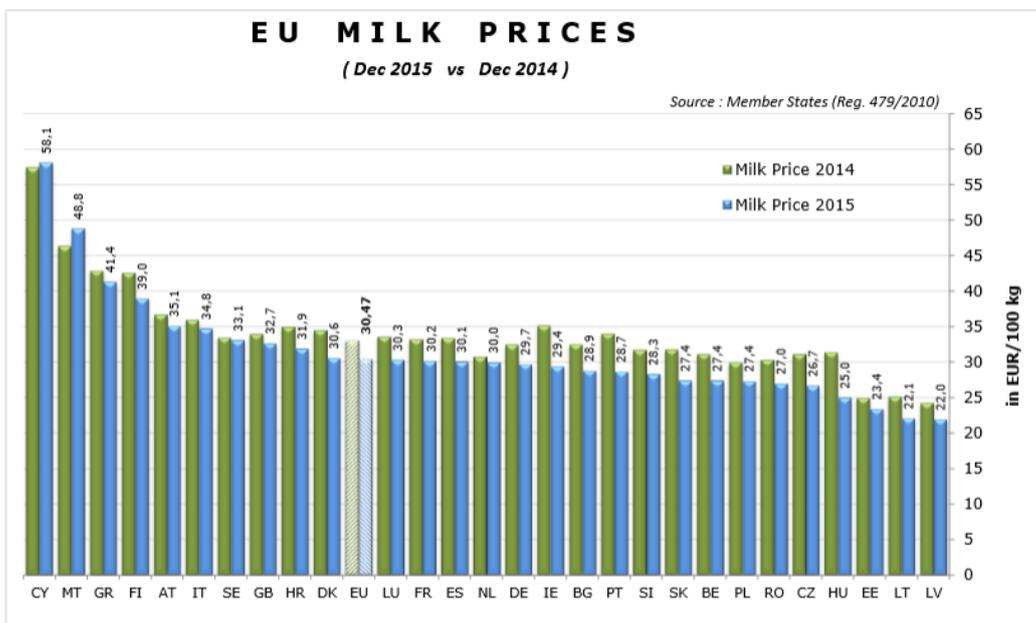
**Graph No.8: Price of raw milk in 2014-2015 in EU's member states**



Source: Milk market observatory, 2016

The average prices of all member states of milk for the period 2014-2015 are shown in the graph number 9. The EU's average for year 2015 was 30.47 € per 100 kg. Prices in the Czech Republic are deeply under the EU's average, it was 26.7 € per 100 kg, lower prices had only Hungary, Estonia, Latvia and Lithuania. Prices of raw milk in Germany was 29.7€ per 100 kg in year 2015. There is a difference 3 € per 100 kg between Czech and German prices.

**Table No. 9: Milk prices of EU's member states in 2014-2015**



Source: Milk market observatory, 2016

The volatility of milk price is demonstrated in the table number 11. The price scale paid by dairy plants to milk producers is in range from 5.89 CZK per one liter to 10.04 CZK per one liter. The lowest price 5.89 CZK per one liter was paid after the world economics crisis and in general all year 2009 was very weak for milk producers.

**Table No. 12: The average purchasing prices of one liter milk in CZK (paid by dairy plants)**

Year / Month	I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	XII.
2001	7.67	7.70	7.69	7.73	7.75	7.75	7.74	7.73	7.81	7.95	8.07	8.13
2002	8.25	8.23	8.22	8.20	8.15	8.08	8.04	8.01	8.04	8.05	8.08	8.08
2003	8.02	7.99	7.93	7.82	7.72	7.69	7.65	7.64	7.69	7.74	7.77	7.82
2004	7.90	7.89	7.96	7.94	7.99	7.99	8.03	8.03	8.11	8.24	8.31	8.34
2005	8.42	8.43	8.44	8.37	8.32	8.28	8.17	8.17	8.19	8.20	8.20	8.18
2006	8.13	8.06	8.05	7.95	7.84	7.76	7.60	7.59	7.61	7.67	7.72	7.76
2007	7.81	7.80	7.79	7.79	7.80	7.79	7.88	8.08	8.48	9.37	9.98	9.99
2008	10.04	9.98	9.69	9.19	8.74	8.44	8.07	7.89	7.73	7.46	7.13	6.83
2009	6.43	6.17	6.08	6.06	6.02	5.95	5.89	5.91	5.99	6.17	6.39	6.67
2010	6.90	7.08	7.16	7.23	7.30	7.34	7.37	7.46	7.62	7.77	7.89	8.02
2011	8.08	8.15	8.20	8.24	8.27	8.27	8.29	8.27	8.29	8.33	8.37	8.38
2012	8.35	8.30	8.14	7.83	7.53	7.30	7.19	7.21	7.30	7.48	7.68	7.80
2013	7.93	8.05	8.12	8.20	8.24	8.29	8.36	8.50	8.72	8.99	9.28	9.49
2014	9.66	9.72	9.75	9.72	9.61	9.51	9.46	9.29	9.07	8.95	8.86	8.84
2015	8.52	8.39	8.31	8.15								

Source: Author's adaptation according to SZIF, 2015, p. 7

The scissors between producer's price and consumer's price in the Czech Republic are opening disproportionately. The average purchase price of milk is still lower than production costs. The fair price would be according to producers 9 CZK per one liter of milk.

## 5 Result and discussion

The Czech Republic is still self-sufficient, it is produced more than consumed. Nevertheless the situation on the Czech dairy market is decreasing trend of number of cows and hand in hand a decreasing trend of milk production since year 1994 till nowadays. There were 429.3 thousands of cows in the Czech Republic in year 2004, now it is only 372.39 thousands. On the other hand the yield of milk milked by one cow increased rapidly in the period 1994 till 2014. The genetic research for breeding, feed efficiency and good allocation of subsidies for dairy production caused that the yield increased from 3 964 liters of milk per one cow in one year in 1994 to 7 705 liters of milk per one cow per year in 2014.

Regarding to the dairy sector, Germany is the most important trade partner for the Czech Republic. The export from the Czech Republic represents 29% from the total dairy export and import to the Czech Republic is 42% from total dairy import. The trade balance is positive, that means Czech export still exceeds German import. Both export as well as import are constantly increasing, nevertheless the share of imported dairy products to the Czech Republic had increased last few years. Germany, with 49,1% in year 2012, has a dominant position in import of yogurts.

Typical features for Czech dairy companies are many foreign investors that is beneficial for Czech economy. More capital from abroad may contribute to better technologies and other improvements. But the ownership of Czech dairy plants by foreigners can have a negative impact in a long term. There were more exclusively Czech dairy companies in the past and nowadays there are many shareholders from abroad that own major part of the dairy company. For example the German dairy plant Müller owns 100% of dairy company Pragolaktos, the French company Lactalis, the second biggest dairy company in the world is the main shareholder of the dairy company Kunín. To equal to large world dairy companies, the Czech dairy plants may find the power in cooperations or under ownership of big Czech concern AGROFERT.

There is a quite obvious difference between Czech and German dairy companies. German dairy plants usually aroused by merger with other dairy plants and gain property by acquisition. More significant difference is, that German dairy plants invest more into

product development, they are very focused on innovations and provide very good conditions with special facilities and new technologies for constant improvement of their products, however Czech dairy plants are more focused on tradition and high quality. The assortment from some German dairy companies is incredibly large. Czech dairy companies are usually focused on few products, in which are the best and in awareness of consumers.

The EU accession in 2004 caused changes in all Czech agriculture. The Czech dairy industry has been struggling after the EU accession, because Czech dairy companies had to invest lot of money to meet strict hygienic and technical standards of the European Union, to ensure a healthy sanitariness of food and consumer protection. The positive contribution to the milk producers from the EU is a support in form of the United payment for agricultural land, when farmers got 6 068.88 CZK per one hectar in year 2013. Not all within the European Union is harmonised and therefore the value added tax in every member state is different. The value added tax for milk in the Czech Republic is 15% and in the most of the member countries it is a lower number. The value added tax in the Germany is only 7% that has also impact on the price of the final product.

The price of the milk in the EU is influenced by world demand and world market price. In 2014 the world demand, mainly in the Asia has increased and it caused the world decrease of the milk prices. Another influential factor is exchange rate of Euro towards American dollar. All occasions caused the slump of raw milk prices in most of the EU's member countries in 2014-2015. Experts explain, that the main reason was Russian embargo imposed on all EU's countries in 2014, which caused surpluses of milk and dairy products in EU. The average worsening of price was -8%. The Czech Republic has the 5<sup>th</sup> lowest price (lower have only Lithuania, Latvia, Estonia and Hungary) within EU and therefore the Czech milk producers sell their milk into Germany, where they will get more money per one liter and get higher profit. The average price in the Czech Republic paid to milk producers in year 2015 was 26.7 € per 100 kg and in Germany it was 29.7% per 100 kg.

The mutual trade between the Czech Republic and Germany might be influenced by abolishing of milk quotas. Because Germany has exceeded the milk quotas, it is supposed, that now they will use their entire production capacities and will produce more milk, it can lead to lower demand of raw milk from Czech farmers.

## 6 Conclusion

Milk represents an important role in life of Czech population likewise in all the world. The milk production in the Czech Republic contributes to keep the employment in agriculture and comprises the biggest share of agricultural turnovers. The dairy industry in the Czech Republic covers 17% of the sales and 10% of employees of the whole food industry. The milk production positively contributes to the social and economical sphere. The milk production provides job opportunities for farmers, processors, traders and another subjects participating in milk and dairy products trade.

After European Union accession, with increasing free trade and globalisation the Czech dairy sector faces to strong competitiveness. Decreasing trend in number of cows as well as in production of milk were recorded in last years. This is compensated by annual increase of milk yield per one cow.

The trade of milk and dairy products between the Czech Republic and Germany is influenced by many factors. The price of the milk is determined by weather conditions, by the world demand for milk and dairy products and by economical aspects such as exchange rate of Euro towards American dollar. Every member state of the European Union was struck by Russian embargo that caused milk surpluses and therefore decrease of price of milk. The difference in price for the final product can be affected by the size of dairy farming and the quantity of certain constituents and value added tax, while in the Czech Republic it is 15% in Germany it is only 7%.

Differences between prices of raw milk to milk producers between the Czech Republic and Germany are still high enough for Czech farmers to export their milk rather to the Germany than to the Czech dairy companies. Additionally there is an unreasonable difference between producer's price and consumer's price in the Czech. The average purchase price of milk is still lower than production costs, which is not sustainable for milk producers.

There is no problem regarding to the fact, that Czech raw milk is exported to the Germany and imported back in form of dairy product, because it is a part of free trade and larger assortment is offered to consumers. Nevertheless it has to be kept in mind that dairy products coming from the Germany have higher value added and if more final dairy

product will be imported to the Czech Republic and less raw milk will be exported to the Germany, it could have a negative impact on the Czech international trade balance.

Within strategy of German dairy companies is focus on product and research development with large investment that can give German companies advantage over Czech dairy plants. All these aspects have impact on success of products on the market, however it is necessary to know the consumer behaviour in the certain country. German customer has different priorities during purchasing of dairy products than Czech customer.

The international trade between the Czech Republic and Germany with dairy products is still profitable for both sides, but it is needed to control it and do not allowed more foreign companies to own major part of share of Czech dairy companies and leave it in hands of Czech owners, that know the Czech consumers the best. The Czech dairy farmers must be able to remain competitive on EU dairy market that unfortunately seems to be with every year more challenging.

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## **List of abbreviations**

ASEAN	Association of South East Asian Nations
CAP	Common agriculture policy
CEE	Communauté économique européenne
CEFTA	Central European Free Trade Agreement
CSK	Czechoslovak crown
CZK	Czech crown
ČSÚ	Český statistický úřad
DMK	Deutsches Milchkontor
EU	European Union
EUR	Euro
EC	European Community
FAO	Food and agriculture organization of the United nations
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GmbH	Gesellschaft mit beschränkter Haftung (Ltd.)
H-O model	Heckscher – Ohlin model
MERCOSUR	Mercado Común del Sur
MUH	Milch-union Hocheifel
MZV	Ministerstvo zahraničních věcí (Ministry of foreign affairs)
NAFTA	North American Free Trade Agreement
Plc.	Public limited company
SGAFF	Supportive and grant agricultural and forest fund
UHT	Ultra-high temperature processing
U.K.	United Kindgdom
USA	United States of America
VAT	Value adde tax
WHO	World health organization
WTO	World trade organization

## Annexes

### Annex 1: Import and export of processed dairy products

#### Import and export of cheese and curd

Year	Import		Export	
	Trade value (US\$)	Weight in kg	Trade value (US\$)	Weight in kg
2015	121 951 414	42 780 926	11 609 326	3 018 040
2014	175 161 885	44 132 943	13 217 868	2 490 463
2013	159 351,812	40 229 808	2 087 768	360 124
2012	133 395 743	38 811 128	1 257 382	256 660
2011	144 088 705	37 352 918	10 488 091	1 841 549
2010	115 437 031	34 262 928	1 287 538	259 171
2009	98 047 403	32 467 568	4 726 477	1 021 531
2008	96 079 053	25 879 530	9 693 836	1 907 555
2007	89 914 988	33 192 274	5 241 447	1,180 642
2006	50 351 632	19 726 803	9 135 625	2 836 100
2005	39 733 933	14 481 746	6 870 779	1 840 391
2004	17 847 029	5 285 904	4 231 986	1 125 907
2003	6 963 652	1 969 249	4 498 225	1 544 643
2002	5 434 771	1 847 790	1 834 208	716 594
2001	3 889 522	1 395 590	3 551 985	1 228 865
2000	5 126 804	2 461 820	1 278 184	545 986

Source: Author's adaptation according to Comtrade, 2016

#### Import and export of yogurt, buttermilk, curdled, fermented or acidified milk and cream, ice - cream

Year	Import		Export	
	Trade value (US\$)	Weight in kg	Trade value (US\$)	Weight in kg
2015	39 969 347	26 614 016	4 238 499	9 562 700
2014	51,996 872	29 072 839	7 205 903	10 701 590
2013	51 977 296	29 746 936	7 324 466	7 688 479
2012	48 422 196	29 096 773	9 894 406	8 290 793
2011	51 532 005	29 652 133	11 631 193	8 549 795
2010	44 626 027	30 149 958	14 715 524	10 415 810
2009	41 708 303	26 585 124	11 858 416	8 459 975
2008	49 517 961	32 455 460	11 230 789	6 568 796
2007	41 564 924	29 480 344	9 537 634	6 734 134

Source: Author's adaptation according to Comtrade, 2016

### Import and export of butter

Year	Import		Export	
	Trade value (US\$)	Weight in kg	Trade value (US\$)	Weight in kg
2015	31 256 645	8 859 991	227 170	55 208
2014	40 222 678	8 212 943	74 004	22 261
2013	42 596 988	7 694 000	272	34
2012	39 734 537	8 245 760	110 712	31 483
2011	39 177 398	6 860 000	815 901	149 891
2010	43 577 196	9 272 422	4 297 304	1 632 342
2009	34 698 570	8 919 968	15 113 582	6 016 396
2008	38 330 420	8 605 702	22 494 981	6 676 283
2007	28 435 642	4 558 838	28 340 666	11 088 769
2006	18 745 069	3 943 950	21 371 997	9 846 361
2005	8 029 022	1 831 279	6 322 752	2 962 615
2004	3 698 135	887 600	7 188 385	2 325 824
2003	5 227 210	3 082 572	3 450 899	2 377 191
2002	4 568 063	3 629 964	2 015 621	1 792 975
2001	2 252 724	1 518 826	2 563 682	2 097 384
2000	904 829	435 457	1 357 863	1 006 856

Source: Author's adaptation according to Comtrade, 2016

Annex 2: Milk quotas of EU states and levies

Indicator/ Country	BE	BG	CZ	DK	DE	EE	IE	EL	ES	FR	HR	IT	CY	LV	LT
<b>Total deliveries</b>	3 565 118	451 780	2 585 347	4 949 042	30 811 593	682 790	5 818 686	624 344	6 353 675	24 203 228	499 926	10 759 748	160 678	758 506	1 369 800
<b>Quota for deliveries</b>	3 566 808	980 635	2 906 440	4 847 745	30 222 767	686 682	5 782 644	878 298	6 499 912	25 998 234	697 027	10 874 326	155 030	765 401	1 753 485
<b>Overrun, tonnes</b>	-1 690	-528 854	-321 093	101 296	588 826	-3 893	36 041	-253 954	-146 237	-1 795 006	-197 101	-114 578	5 648	-6 894	-383 685
<b>Levy, 1000 EUR</b>				+28 191	+163 870		+10 030						+1 572		

Indicator/ Country	LU	HU	MT	NL	AT	PL	PT	RO	SI	SK	FI	SE	UK	EUR28
<b>Total deliveries</b>	295 072	1 415 508	41 235	12 447 136	3 000 483	10 076 427	1 777 122	865 503	514 821	839 339	2 281 342	2 820 020	14 073 197	144 041 447
<b>Quota for deliveries</b>	292 106	1 957 288	52 206	11 972 399	2 908 432	9 909 486	2 080 101	1 558 361	597 058	1 075 921	2 615 221	3 589 230	15 749 697	150 972 940
<b>Overrun, tonnes</b>	2 966	-541 780	-10 971	474 737	92 051	166 941	-302 979	-692 858	-82 237	-236 583	-333 880	-769 209	-1676 519	1 468 507
<b>Levy, 1000 EUR</b>	+825			+132 119	+25 618	+46 460								+408 685