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SUMMARY OF THE
DOCTORAL THESIS
COMPARATIVE STUDIES CONCERNING ANIMAL
PRODUCTION STATE, TENDENCIES, AND PROSPECTS IN
ÎN ROMÂNIA AND EUROPEAN UNION

SCIENTIFIC COORDINATOR
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Foreword

It is well known that for Romania, agriculture is a priority claimed on both natural and human resources of the Romanian agriculture and the vital social and economic functions of this branch.

Enrolling in this context, the research conducted in this thesis entitled "COMPARATIVE STUDIES CONCERNING ANIMAL PRODUCTION STATE, TENDENCIES, AND PROSPECTS IN ROMÂNIA AND EUROPEAN UNION" were focused on the livestock resources (cattle, sheep, goats, pigs) in EU countries, Romania and Vâlcea county by emphasizing the differences between our and European farms and livestock production recorded in the countries analyzed. The thesis, presented over 311 pages is divided into three parts, namely "CURRENT STATE OF KNOWLEDGE IN THE FIELD" in which are presented the theoretical assumptions of the study over 43 pages, representing 13.82% of the thesis, part Two "MATERIAL AND METHOD", which presents both the materials used for the study and also the methodology that was implemented, and IIIrd, TRENDS AND RESULTS OF THE ANIMAL PRODUCTION - RESULTS AND DISCUSSION ". The last two parts of the thesis have been presented in 276 pages, or 87% of the thesis, in 71 tables and 221 figures. The conclusions of the study and a list of references that includes 117 titles, completes the paper. In addition to these are also included seven annexes, the list of tables, the list of figures, and the summaries in both Romanian and English languages.

Finally I want to address acknowledgment to everyone who helped me in writing this thesis, mainly Professor Emilian Merce PhD., from whom I have received competent support throughout all the research but also in writing of the thesis.

The Author
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INTRODUCTION

For Romania, agriculture is an absolute priority, affirmation based on both the natural and the human resources of the Romanian agriculture, but also on the vital functions of this branch meaning the social and economic functions, ensuring public consumption, the necessary raw materials for industry, an active and profitable export of agricultural products, protecting environment and landscape, maintaining ecological balance, and developing the rural area (Alecu et al., 1997).

Agriculture plays a crucial role in supplying the population with food products and the industry with raw materials, as well as providing the necessary needs for export and satisfying other economic needs for any country (Gibson et al., 2001). In the mid-nineteenth century, Ion Ionescu de la Brad, says that "The scientists and the governments, appreciating the knowledge of the Romanian people, assessing them at their fair value, are required to compare their knowledge with the knowledge of other nations at whom agricultural science was familiar before Romanians, than to see what the Romanians own and what do they need to align to those nations most advanced in agriculture".

Agriculture is a branch less exposed to product innovations due to the fact that nature cannot be changed from one day to another, as in the case of industrial products (Arion et al., 2012). However, in this industry also, technical and technological innovations penetrate more rapidly, influencing the competitiveness of farmers work (Katsioloudes et al., 2007), without neglecting environmental issues covered by national and EU official documents (eg OU 34/2000 Law no. 38/2001, HG 917/2001, HG 677/2001, www.europa.eu.int/eur-lex etc.).

According to the Economical Index Year-book (1997), "Technological progress and globalization generates constant pressure on the European Union member countries, requiring new efforts to maintain and improve their position on the competitiveness scale." Competitiveness has emerged in economic theory primarily as a micro concern quartered to business activity (Margaret Marian, 1994).
A real competitiveness implies that the resulted profit to be "normal" while the structure and level of costs are not unfavorable. (Alexa et al. 2012). In a broad sense, competitiveness is the ability to face competition in the market, true technology level, but also by sales volume (Baumol et al., 2012).

According Merce and Ivan (2005) in the last six decades, the annual consumption of bread per person in Europe has declined from 200 kg to about 70 kg. In the same time the annual consumption of meat increased from 30 kg to 70 kg. Knowing that the production process is a process of nature transformation according to the technical, economic and social development degree, reached by society, it can be said that for any production type or periods it corresponds one certain agrarian structure. (Scarborough et al., 2009).

After Alecu et al. (2001), European agrarian structures are divided into three types:

- **English system**, characterized by the concentration of land ownership and livestock in large units;
- **Danish system**, where cooperative system for supply is distinctive, processing, storage, sales and services, integrated with food industry for all farms, regardless of size;
- **Russian (Soviet) system** characterized by co-operative and state ownership, which focused the land, the livestock, the capital, in conjunction with manufacturing and services, ensuring the concentration and specialization of production in large farms.

These systems are found, totally or partially in all European countries. The features and differences in terms of agriculture between the Western and Eastern countries, are the result of the continued reform in modern and contemporary Western countries and that discontinuity of agrarian reforms in Eastern countries with implications for enhancing agricultural structures and continuity accumulations. (Pop, 2004)
THE AIM OF THE RESEARCH

This paper aims to pursue the issues related to the livestock resources (cattle, sheep, goats, pigs) in the European Union by emphasizing the differences between our and the European farms, and also the productions obtained in the livestock sectors recorded at these countries. In European countries the current trend in agriculture is to support long-term viability of this sector, and also to improve the quality of the products offered to consumers (Kish et al., 2003). It aims to:

- reduce production and food processing costs;
- improve the quality and wholesomeness of products;
- advance environmental practices so as to ensure the viability of agricultural products.
- technology transfer.

Instead, Romanian farm development is determined by a number of characteristics such as:

- the average size of farms
- technical equipment;
- the natural conditions in which they operate, etc..

Supporting the farmers in their relation with financial institutions, banks, insurance companies are a very important feature (Hatten, 2009), because farmers will engage contact with such institutions and the rigor found in these areas is well known, and therefore farmers will be imposed with these rules regarding the necessary information in contact with consulted institutions and they will also assimilate knowledge which will help them lay the foundations of future performant farms that approach the EU requirements (Dobrin et al. 2010).

THE OBJECTIVES OF THE RESEARCH

Inside the European Union countries, agricultural management aims to solve an important problem of stopping overproduction and increasing product quality. Also, a
special attention is given to the environmental protection problems. To achieve this objective, the loans for agro-environmental programs are in continues growth, as well as the training programs in the field (Alexa et al., 2012).

In Romania, the need to modernize the working systems has been sporadically send to farmers (Manole et al., 2004), by assistance measures, or agricultural policy, or through instruments of agricultural policy implemented through the Ministry's structures in the territory, by advising his own products, awarded by major companies producing agricultural impute, or even through counseling offered by various private (Borza et al., 2009).

The systematization of knowledge on modern management with computer assistance is just at the beginning in our country (Alecu et al., 2001).

The main objective of the research paper is to track the trends and prospects of the animal products in the European Union.

Achieving this goal requires achieving the following secondary objectives:

1. Highlighting the differences between our farms and those found in the European Union, as livestock issues (cattle, sheep, goats, pigs), their main production (meat, milk) and also the balance of import and export.

2. Determining the general and specific evolutions in animal farms (cattle, sheep, goats, pigs) in EU countries and in the particular case of Valcea county.

PART I

THE CURRENT STATE OF KNOWLEDGE IN THE FIELD

CHAPTER I

THE CURRENT STATE OF THE RESEARCH IN THE FIELD

Because livestock is an area with great potential, occupying traditionally an important place in the structure of Romanian agriculture, it represents an important factor of the social stability and of the maintaining of ecological balance, while being the same time the main branch of production that provides food to the people and large amounts of raw materials for the food and non-food industry.
In Romania, livestock, as well as the entire agricultural sector, presents serious structural problems due to the excessive fragmentation of ownership, low productivity and high self-consumption in farms.

 Romanian livestock performance has low level. The lack of competitiveness is reflected by the low labor productivity, low economic growth and a shortage of agricultural trade balances, given that agriculture and food production can not keep step with the increasing demand for food, driven by the rapid economic growth and can not cope with foreign competition, particularly in the EU. The development of the livestock in the main directions pursued is achieved by feed-back from dynamic reaction closely related to European realities, especially after EU accession. In this context, it is taken for granted the trend of continuously adapting the Romanian realities to Common Agricultural Policy (CAP).

At EU level, according to what was stipulated by (CAP) trends were and are primarily focused on enhancing the competitiveness and sustainability of the European agriculture, together with the continuous development of the rural areas.

The Sustainable component of livestock management both in Romania and at European level, involves a higher management of the natural resources required to ensure an adequate diet, achieved through a series of specific practices such as: crop diversification, the maintenance of permanent grassland, the conservation of areas of ecological interest, but also of landscape elements.

At the present time, for the reason to find a common nominator for livestock development and environmental constraints, are encouraged activities that focus on research - development and innovation, through a closer connection between the production activity and scientific-activity. The contribution that livestock can bring to rural development is largely conditional beside the proper management for the local conditions to also market requirements and risk improving management, boosting resource efficiency and promoting social inclusion.
1.1. THE IMPORTANCE OF LIVESTOCK
   - COMPARATIVE ACHIEVEMENTS IN DIFFERENT COUNTRIES -

Livestock is a very important branch of agriculture: firstly because it exploits the crop production and secondly because it provides a significant amount of human food and provides raw material for the food industry (Hovi et al., 2003). Livestock has experienced structural transformations in Romania after 1989 by passing true the state sector in the particular sector of a major livestock, but also by largely decreasing the their number and quality, which negatively impacted the market prices .(Merce et al., 1999 , 2000). Therefore, the consumption of such products has also decreased, and the market was flooded with cheaper imported food (Margaret Kish et al., 2001). An important role of livestock is the one related to the opportunities in which it provides workforce. (Kalim, 2009 Militaru, 2010).

1.2. THE ROLE OF THE FARMING SECTOR IN ROMANIA

In Romania, livestock is a main branch of the agricultural economy, given the advantages due to the natural factors, pedo-climatic on production. However, it should be noted that Romanian agriculture and livestock are homogeneous entities, which still continues to record changes in terms of operating and unstable structures in terms of the formation of production structures destined to meet the market requirements and the efficient use of natural and human resources in rural areas. The most obvious changes have occurred in the structure of the individual farms, on size classes, due to several factors, mainly represented by land regulations from who benefited especially smallholders, and the farm owners of 5-10 hectares. The changes in share holdings by size classes from 50-100 hectares and over 100 hectares of total holdings and total area is, however, insignificant.

In the context of livestock sector in our country’s economy, it is important to emphasize the management’s role of livestock farm primarily in choosing the optimal
technology of exploitation of species / species of animals bred in order to achieve efficient production.

Knowing that farming technology represents a set of processes, methods, technical and organizational measures that are carried out in a well-defined technological process and are aimed to satisfy the animals demands obtaining high productions in terms of economic efficiency, its choice is important depending on the purpose of its implementation. In this regard, it should be noted that the technical and organizational processes and measures that create a farming technology according to their characteristics and purpose, are grouped in the following subsystems:

 The breeding subsystem;
 The growth and development subsystem;
 The maintenance subsystem;
 The feeding subsystem;
 The health insurance subsystem;
 The production and value subsystem;
 The working processes organization subsystem

Thus, due to the selection of appropriate technological options composed of specified subsystems it can be design the whole technology for an animal category (eg growth and exploitation of dairy cows technology; young cattle technology, sheep or pigs, poultry meat and technology eggs and so on). The materialization of the farming technologies is carried out in technological descriptions which represent technical and economic documents that are mandatory to record for each category of animals. Technological descriptions are tools that highlight the growing technology, total production obtained, the costs, and the economic efficiency expressed as:

• costs per animal head;
• fed daily costs;
• costs per unit produced.

An important role in the farm management is played by the production indicators. The most frequently used in determining the livestock’s economic efficiency are: average production per animal feed, cost per animal and per unit of product, feed costs
per day, per animal and per energy unit, consumption per animal or place, man-hours consumption per unit of product, profit per animal.

The activity of animal growth and exploitation requires economical and organizational optimization of the fundamental technological problems. For example:

- In dairy farms they are considered to be: the race, the average production, the threshold of profitability, exploitation period, the period during birth, fat percentage, the paths for milk harness.
- In sow farms: lifespan, the index sows utility, the preferred time for piglets sale, the number of sows according to the number of pigs delivered annually etc.
- In sheep farms: the race, the average breed production of wool and milk lifespan, the optimal period for the sale of lambs etc.
- In animal fattening farms: breed, age and weight of the animals at the entrance age and weight at delivery, average daily gain, duration of fattening of animals per unit area.

1.3. TRADITION AND EXPERIENCE IN USING ANIMAL PRODUCTION IN ROMANIA

The using of livestock production in Romania, mainly to obtain meat, milk and food preparations from these raw materials is closely connected with animal species that have the highest share in the livestock sector.

In the exploitation of animal production a very important role is played by the responsibility of determining production costs. At the main animal products for their quantification, it starts from the size and structure of the direct allocation of human and material resources required for the smooth production processes. On this basis, in a next step, the necessary resources for the general needs of farms and units. The calculation of total costs includes fixed costs and variable costs.

The main **fixed costs** are: constant labor costs, overheads, interest on loans and depreciation expenses.
The main **variable costs** are: those with feeding, with the biological material, with electricity, medicines and sanitary materials, the supply (supply rate), providing animals and other material expenditure category.

A highly effective tool in determining and assessing the economic efficiency of livestock production involves the development and use of a system of indicators to measure and express as accurately as possible the efforts made to obtain production and effects from these efforts. By definition, the indicator is a numerical expression of an economic process or phenomenon, defined in time and space. Indicators can be characterized by absolute size, relative size, medium size, indices and coefficients. The absolute magnitudes are numerical expression, concrete phenomenon and reflect its size. These measures are expressed in physical units of measure specific phenomenon (ha, kg, lei, hours, years). Sizes determine relative percentage as a ratio of two absolute values and refers to the intensity or structure phenomena (structure of livestock, fodder crop structure).

### 1.4. EUROPEAN TRADITIONS IN ENHANCING LIVESTOCK

The natural resources, the feeding possibilities, the environmental features, the own biological and physiological farm animals, the economic, tradition and social changes produced in the EU represent many conditionings for livestock at this space. The animals farm exploitation in optimal conditions is possible only in areas that provide favorable environmental conditions and species breeds considered.

Analysing the European traditions regarding livestock can not be achieved without treating aspects of agricultural policy consists (CAP). The ear 2012 marked the 50th anniversary of the implementation of the Common Agricultural Policy (CAP). Its premises, however, were provided with the Rome Treaty, ratified in 1957, which laid to the foundation of the European Economic Community. Currently, CAP is subjected to a reforming process, to strengthen the competitiveness and sustainability of agriculture and rural areas in the EU. Since the implementation of the CAP, it continues to face the economical, environmental, and territorial challenges with whom Europe currently faces.
CAP has been for many years the first and only fully integrated EU policy. It paved the way for the EU single market 30 years later in 1992. Her unique pricing system imposed by the CAP to create their own currencies 'unit of account' (UC), a distant precursor of the euro. Since its introduction in 1962, a UC equivalent to one U.S. dollar. CAP inception, many small farmers in the postwar generation still milked cows by hand and sewed hay with scythes. As integrated common policy, the CAP is funded through annual EU budget. Currently, annual spending on agriculture and rural development accumulate about 55 billion, around 45% of the total EU budget. CAP expenditure peaked at 72% of the EU budget in 1984 and then declined steadily (http://ec.europa.eu/agriculture/50-years-of-cap/files/history/history_book_lr_ro.Pdf).

At EU level, there is a growing concern, underwritten Common Agricultural Policy and the Europe 2020 objectives (sustainable growth, smart growth inclusive) for boosting livestock farm. In support of this goal, the European Community manages a number of funds to support the role of farmers in member countries, among which may be mentioned:

- European Agricultural Fund for Rural Development (EAFRD)
- European Regional Development Fund (ERDF)
- European Social Fund (ESF),
- Cohesion Fund (CF).

1.5. POSITIVE EXPERIENCES IN USING ANIMAL PRODUCTION

The useing of livestock production is a continuous challenge not only at EU level but also worldwide. Thus, the main livestock production represented by the results of the increase in cattle, sheep, goats, poultry and pigs at the European Union level, between 1989 - 2010 present different trends depending on the type of production that is analysed.

At EU level, harnessing the animal production presents specific features based on typology. The meat production reaches considerable, as noted above, at EU mainly due to higher cash processing. The Recovery of animals is a very complex process which is not conditioned by aspects of the production process, but largely by market structure.
(Hameed et al., 2011). It is primarily characterized by consumer’s demand, which in the EU is very circumspect and has an attitude based on a complex set of interacting factors of which we can mention:

- economic factors,
- technical factors,
- socio-cultural factors etc..

Also, at the macroeconomic level, the consumer’s demand is determined by a complex set of factors such as:

- The annual growth rate of population and structural changes by age
- The consumer response to price variation
- The consumer reaction to changes in their income.

In the process of recovery of livestock production an important role is played by both globally and at the European level, the European Union and Romanian implementing marketing concepts (Rees, 1991) modern training methodologies of those concerned (Corn, 2001 Sun, 2008) adaptation of the human resource market realities and initiating innovative ways to trade (Alzola et al., 2005).

1.6. MAIN FEATURES OF ANIMAL PRODUCTS IN EU AND ROMANIA

The consumer’s requirements and the continuous improvement of breeding technology is expected to lead to reduced production from meadle-aged animals in favor of youth animals, both in EU and in Romania. At this current stage, the Romanian producers can capitalize meat production through delivery to an intermediary (for export or domestic), or slaughtering and marketing their own. This hampers the animal collection for slaughter. In the meat channels of, after 1989 in Romania has developed a dual grid. In 1999 there was a total of over two thousand meat processing units. Beef quality is compromised, considered secondary to the milk product.

Currently, for the meat production sector in Romania there is a reduced technical and economical competitiveness, due to:
• a low weight at slaughter;
• the registration of reduced daily weight gains;
• reduced feed conversion rate.

The lack of quality and consistency of the supplied products is another constraint which prevents the purchase of meat in Romania. The failure to meet quality requirements will not only further lead to increased import penetration.

II\textsuperscript{nd} PART
MATERIAL AND METHOD
CHAPTER II
MATERIAL AND METHOD

2.1. THE NATURAL GEOGRAPHICAL AND SOCIO-DEMOGRAFIC CHARACTERISTICS OF ROMANIA AND VÂLCEA COUNTY

Romania is located in southeastern Central Europe, on the Lower Danube, north of the Balkan Peninsula and the northwestern coast of the Black Sea in the northern hemisphere at the intersection of the parallel 45 ° north latitude and the meridian of 25 ° east longitude.

The average annual temperature rises in the south to about 11 ° C in the north, at altitudes comparable values of this parameter are lower by about 3 ° C. Between the western and the eastern part of the national territory, the thermal difference is reduced to 1 ° C (10 ° C in the West, 9 ° C in the east). The country landscape has a crucial role in climate delimitation and floors. The Carpathian Mountains form a barrier separating the harsh continental climates of the eastern oceanic and western Adriatic type. In conclusion, the climate is temperate-continental one, with four seasons and is marked by influences of steppe climates east adriatic south-west Western Ocean and northwest, keeping however the identity of the Carpathian climate - Ponto - Danube.
Precipitation are moderate, ranging from insufficient amount of 400 mm to 500 mm Field Dobrogea Romanian to 600 mm in the West. With altitude, rainfall increased over 1000 mm per year in places.

Vâlcea County is located in the south-central part of Romania. It stretches along the middle basin of the Olt River, surrounded by mountains to the east and tails Skull Ridge West. The county has an area of 5.765 km² - 2.4% of the total area of the country. It borders the counties of Alba and Sibiu north, east Arges, Olt County to the south and southeast, southwest Dolj, Gorj and Hunedoara west northwest. The county is forthe city.

Through its geographic, Valcea benefit from almost all major forms of relief: mountains Carpathian hills, plateaus and plains plain looking, arranged in steps from north to south, whole gorges of the Olt and Lotrului, guarded by mountains tails , skull, Fagaras, Lotru and Parang. Two-thirds of the county is occupied by Piedmont Plateau and Subcarpații tems, with altitudes between 400-800 m County is temperate continental climate with Mediterranean influences weak

2.2 THE MATERIAL

The research was focused on a wide range of studies. Datas were collected and statistical analyzed from livestock farming (cattle, pigs, sheep, goats) at related productions, and also at import - export balance for our country and the European Union space with the 27 Member States. At the same time, the research has focused in particular with the situation of growing animal simultaneously with agricultural production in Vâlcea County.

The necessary data for this study resulted in an extensive consultation of an expert statistical material. Thus, the data on agriculture and livestock situation nationally and in Vâlcea county were consulted following documents and websites: documents relating to the General Agricultural Census for the period 2002 - 2011, Ministry of Agriculture and Sustainable Development documents on the development livestock farming, the agricultural areas cultivated and production values, the National Institute of Statistics relating to animal production in Vâlcea county endowment of agro-livestock farms in Vâlcea County. Regarding the material needed for the study and processing of livestock
and their main production (meat, milk) in the European Union, Europe and the world, the main source of information was the site ww.fao.org.

2.3. THE USED METHODOLOGICAL TOOLS

The methodological instruments used were in connection with the type of structure the available data, their origin and type of distribution, homogeneous or heterogeneous individual values. There were used parametric tests when the size sample and the distribution data enabled it, or nonparametric, when populations that followed the normal distribution or approximately normal distribution were analyzed, but it was found most suitable the operation with rank values, due to the small size of the sample, and/or data homogeneity (Merce et al., 2007).

IIIrd PART
RESULTS AND DISCUSSION

CHAPTER III
LIVESTOCKS

Where effective considering the overall livestock development in the European Union, starting in 1989, to mark the beginning of major changes at all levels, economic, financial, social, on a global scale, it is found that the fluctuations have been recorded mainly in the sense of a decreasing population, followed in recent years by an easy pick-up for some species, such as goats.

3.1. CATTLE

The study of the evolution of cattle herds to 1000 ha agricultural land in Romania and the countries of the European Union recognized for superior performance in raising
cattle (table 3.1) shows the evolution of the inconsistent development in that sector during the temporary range studied (1965 – 2010), with distinct features, depending on the characteristics of the socio-economic and political organization of each State concerned.

The average indicators of cattle herds to 1000 ha farmland (fig. 3.8.), compiled during the temporary range studied (1965 – 2010) highlights the Netherlands as the State with the strongest branch of animal production represented by the growth of cattle, while in Romania is situated in 5th place in the hierarchy of the seven countries surveyed, the average values close to those of Hungary, to whom record superiority (345.2 versus 251.2), the difference between being indicators provided, however, the statistical significance threshold of 5%.

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</tbody>
</table>

The average number of cattle heads per 1000 ha recorded in Romania differs considerably from that of the countries situated on the superior positions in the rankings improved indicator, the differences being statistically assured significance thresholds of 0.1% (Poland) and 0.1% (Denmark, France and the Netherlands).
Fig. 3.8. The average indicators for the herds of cattle, 1,000 ha farmland (heads) in the states studied, in bloom between 1965-2010

3.2. SHEEP

Romania ranks the first place in respect of flocks of sheep to 1000 hectares of agricultural land (table 3.2), for the most part of time interval analyzed 1965-2010, except for the years 1995, 2000 and 2005. Large flocks of sheep were registered in Spain and the Netherlands, while Denmark was reduced through the development of this sector.

Table 3.2.

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Under the prism analysis calculated average indicators during the temporary range studied (1965 – 2010) is notable for Romania with best performance, followed by Spain (fig. 3.15). The differences between the average indicators of flocks of sheep to 1000 hectares farmland in the two countries are the statistical significance threshold of 5%. In value, the lowest indicator was registered for Denmark, namely 42.30.
In most cases, the differences between the average indicator of the flocks of sheep from 1000 ha agricultural land registered in Romania and those recorded in the previous countries examined are provided in the statistical significance threshold of 0.1% (Denmark, France, Poland and Hungary) and 1% (Netherlands).

3.3. GOATS

The herds of goats to 1000 ha agricultural land (table 3.3), we note that Spain is in first place in the period under review, 1965-2010 respectively, followed by the Netherlands and Romania, while Poland registered the lowest values, goat farming sector occupying a position in the country's livestock only since 1995 (table 3.3).

The evolution of populations of goats per 1000 ha farmland (fig. 3.21) during the years 1965-2010 is characterized by the average indicators confirms that the greatest development of the livestock sector was registered in Spain.
Table 3.3. The evolution of populations of goats per 1000 ha of agricultural land (heads), 1965-2010

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Figure 3.21. Average indicators relating to flocks of goats, from 1000 ha farmland (heads) in the States studied, in bloom between 1965-2010

Medium goat growth indicators are Romania third in the hierarchy of the countries analyzed the differences between it and the Netherlands were not provided to the statistical significance threshold of 5%, but secured against other countries at all levels of significance respectively 0.1% (Spain and Hungary), 1% (Poland) and 5% (France).
3.4. SWINE

In the countries studied swine, swine herds considered at 1000 ha farmland (table 2.1), are characterized by small flocks with an order of magnitude for France, Romania and Spain vs. Denmark, Netherlands, Poland.

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The average indicators of swine herds to 1000 hectares of agricultural land in the period 1965-2010 (fig. 3.28) highlights the development of this sector in the Netherlands and Denmark. Romania is situated in 5th place in the hierarchy of the seven countries surveyed, the average values of the indicator close to Spain, although the record towards superiority (619.8 compared to 541), the difference is not statistically guaranteed to materiality of 5%. The differences between the average number of pigs per 1000 ha recorded in Romania are statistically significance threshold of 0.1% (Denmark, the Netherlands and Poland) 1% (Hungary) and 5% (France). It is noted that the development of the livestock sector represented by raising pigs has experienced different developments in the studied countries, the majority characterized as inconstant tendencies.

The exception is Spain, where this sector has grown steadily, so that the number of pigs per 1000 ha of agricultural land has increased continuously since 1965 to 145.10 ends up in 2010, when 915,60 heads shall be recorded.

An almost similar trend was evident in the Netherlands, where the pig population grew from 1956.80 to 1000 heads ha agricultural land in 1965 to 6391.50 swine heads into 2010 with a slight decline in the period between 2000-2005. In all other States have
seen a decline in swine herds in 2010, compared to the previous period, which points to the decline of this sector of the economy.

![Graph: Average indicators for the pig population to 1000 hectares of agricultural land (heads) in the States studied, in the period 1965-2010](image)

**Figure 3.28.** The average indicators for the pig population to 1000 hectares of agricultural land (heads) in the States studied, in the period 1965-2010

### CHAPTER IV

**PERFORMANCE AND AVERAGE YIELDS**

Regarding the evolution of the value of livestock cattle, sheep, goats and swine at EU level between 1989 and 2010, time reveals various developments, both downwards and upwards.

#### 4.1. CATTLE MEAT

Beef production in the seven countries of the European Union, representative in terms of this indicator, indicates, unanimously, the lack of efficiency of the sector during the period studied, 1965-2010 respectively. If in Romania, Spain and Hungary, the
The evolution of production follows the trend of herds of cattle, the same thing happens in Denmark, France, the Netherlands and Poland, which have highlighted the growing trends of stocks at the end of 2010, accompanied by downward trends of cattle production (table 4.1).

Table 4.1.

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</table>

The average indicators of cattle production, for the period between 1965-2010, ranks Romania on final place in the, in hierarchy consisted of the seven countries takeen into study (16.10), with values close to those obtained for Spain (17.20) and Hungary (16.70), non-statistical assured at threshold 5% significance. Instead, the indicators of cattle production, produced at the same period for Denmark, France, Netherland and Poland differ very significantly from that achieved for Romania (fig. 4.8), the differences being statistically assured the significance threshold of 0.1%.

Fig. 4. The evolution of cattle production of cattle herds to 1000 hectares of agricultural land in the States studied, during temporary interval 1965-2010
Testing the significance of differences between the average indicators of cattle production in the period 1965-2010, allows us to differentiate States productivity taken into study and classify them in States with low production (Spain, Hungary and Romania) and States with high production (Netherlands, Denmark, France and Poland).

4.2. COW MILK

Analysis of cow's milk production within the 1965 – 2010 in the context of this important and valuable natural food resources in major producing countries

Romania and the European Union, reveals a number of specific features (table 4.2). The average indicators of production of cow's milk to 1000 ha farmland (fig. 4.15), for the period 1965-2010 shows the superiority of the analyzed production in the Netherlands, compared to other countries in the study.

Table 4.2.
The evolution of the production of cow's milk to 1000 ha agricultural land (t), 1965-2010

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Romania has a cow's milk production which ranks in the penultimate place in the hierarchy of the seven countries surveyed, characterized by an environmental indicator (282.20 t) close to Spain (203 t) and Hungary (364.80 t), the difference between the indicators being monitored at the statistical significance threshold of 5%.

Similar to the situation the number of cattle heads per 1000 hectares in the period 1965-2010, cow milk production in Romania, expressed through the medium of its
indicator for the same period, differs considerably from that of the countries situated on the superior positions in the ranking of this indicator, the differences being statistically assured significance thresholds of 0.1% (Poland Denmark, France and the Netherlands).

Fig. 4.15. Average indicators on the production of cow's milk to 1000 ha agricultural land (t) in the States studied, in bloom between 1965-2010

4.3. PORK MEAT

Swine production experienced a fluctuating trend in all EU countries under study in the period 1965-2010, except Spain (where it is recorded and an uptrend of herds in the analyzed time interval), is in decline in 2010 (table 4.3).

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</table>

In the period under review, 1965 – 2010, the average indicators of pork production in the seven States studied, put Romania on the last place in the hierarchy of these (45,30), with the lower value obtained for indices close to those obtained for Spain.
(62,60) and France (63,10), provided the statistical significance threshold of 5% (Figure 4.22).

For Denmark (457,10), the Netherlands (631,60), Hungary (120,90) and Poland (106,60) were obtained from meat production indicators which differ very significantly from that achieved for Romania (fig. 4.22), the differences being statistically assured the significance threshold of 0.1%. This allows us to hierarchize the seven countries studied in the period 1965-2010, into three categories: poor (Romania) producing, with average production (Spain and France) and production (Denmark, the Netherlands, Poland and Hungary).

Figure 4.22. Average indicators on the production of pork per 1000 ha agricultural land (t) in the States studied, in bloom between 1965-2010

4.4. SHEEP MEAT

In terms of production of sheep meat, Romania is distinguished by the fluctuating trend of production throughout the period under review, which indicates a lack of consistency in production strategies in this area, even before the 1990s. However, the trend is upward, productive in 2010 with a yield of 4.63 at 1000 ha farmland, bigger than in 2005, and 3.60 t sheep meat (table 4.4). The average indicators of sheep production Romania ranks the third in the hierarchy of the countries considered in the study. For Denmark (0,49), Hungary (WB) and Poland (WB) were obtained from meat production
indicators which differ very significantly from that achieved for Romania (Figure 4.29),
the differences being statistically assured the significance threshold of 0.1%.

### Table 4.4. The evolution of sheep production 1000 ha agricultural land (t), 1965-2010

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Danemarca</td>
<td>0.53</td>
<td>0.76</td>
<td>0.20</td>
<td>0.16</td>
<td>0.25</td>
<td>0.56</td>
<td>0.57</td>
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<td>0.64</td>
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<tr>
<td>Franta</td>
<td>3.42</td>
<td>3.76</td>
<td>4.48</td>
<td>5.93</td>
<td>6.13</td>
<td>6.33</td>
<td>4.79</td>
<td>4.56</td>
<td>3.40</td>
<td>4.16</td>
</tr>
<tr>
<td>Olanda</td>
<td>5.75</td>
<td>5.79</td>
<td>8.81</td>
<td>10.68</td>
<td>5.30</td>
<td>8.43</td>
<td>8.08</td>
<td>9.51</td>
<td>7.02</td>
<td>6.87</td>
</tr>
<tr>
<td>Polonia</td>
<td>1.20</td>
<td>1.35</td>
<td>1.06</td>
<td>1.15</td>
<td>1.62</td>
<td>1.78</td>
<td>0.35</td>
<td>0.08</td>
<td>0.07</td>
<td>0.07</td>
</tr>
<tr>
<td>Romania</td>
<td>3.49</td>
<td>5.61</td>
<td>4.97</td>
<td>5.48</td>
<td>5.77</td>
<td>7.51</td>
<td>5.12</td>
<td>3.64</td>
<td>3.60</td>
<td>4.63</td>
</tr>
<tr>
<td>Spania</td>
<td>4.40</td>
<td>4.59</td>
<td>4.92</td>
<td>6.08</td>
<td>6.95</td>
<td>7.85</td>
<td>8.21</td>
<td>8.39</td>
<td>8.10</td>
<td>4.74</td>
</tr>
<tr>
<td>Ungaria</td>
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<td>1.09</td>
<td>1.14</td>
<td>1.26</td>
<td>1.52</td>
<td>0.93</td>
<td>0.32</td>
<td>0.62</td>
<td>0.15</td>
<td>0.14</td>
</tr>
</tbody>
</table>

Uninsured statistics to differences of significance threshold of 5% has been obtained between the average production index of sheep meat of Romania (4.98) and France's average indices (4.70) and Spain (6.42), while between Romania and the Netherlands differences between production indices were secured to the statistical significance threshold of 5%. This allows us to hierarchize the seven countries studied in the period 1965-2010, into three categories: poor producing (Denmark, Hungary and Poland), with average production (Romania, Spain and France) and production (Netherlands).

**Figure 4.29.** Developments in the production of sheep meat per 1000 ha of agricultural land in the States studied, during temporary interval 1965-2010
4.5. GOAT MEAT

Meat goat production presents a distinct from that of other productions analyzed in the present study (table 2.7). This is primarily due to the fact that two of the countries under study, Denmark and Poland, respectively, are not producing goat meat during the time studied. As regards Denmark, this condition is explicable because the country has not reported the flocks of goats.

Table 4.5. The evolution of the production of goat meat per 1000 ha agricultural land (t), 1965-2010

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Danemarca</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
</tr>
<tr>
<td>Franta</td>
<td>0,22</td>
<td>0,22</td>
<td>0,25</td>
<td>0,27</td>
<td>0,30</td>
<td>0,31</td>
<td>0,26</td>
<td>0,23</td>
<td>0,24</td>
<td>0,41</td>
</tr>
<tr>
<td>Olanda</td>
<td>0,10</td>
<td>0,13</td>
<td>0,16</td>
<td>0,20</td>
<td>0,30</td>
<td>0,45</td>
<td>0,12</td>
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<td>0,16</td>
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<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
</tr>
<tr>
<td>Romania</td>
<td>0,18</td>
<td>0,28</td>
<td>0,26</td>
<td>0,29</td>
<td>0,46</td>
<td>0,52</td>
<td>0,44</td>
<td>0,29</td>
<td>0,23</td>
<td>0,54</td>
</tr>
<tr>
<td>Spania</td>
<td>0,43</td>
<td>0,46</td>
<td>0,44</td>
<td>0,49</td>
<td>0,63</td>
<td>0,59</td>
<td>0,54</td>
<td>0,60</td>
<td>0,49</td>
<td>0,33</td>
</tr>
<tr>
<td>Ungaria</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,00</td>
<td>0,01</td>
<td>0,03</td>
<td>0,06</td>
<td>0,07</td>
<td>0,04</td>
</tr>
</tbody>
</table>

For Poland, however, the situation is different, because since 1990 recorded actual goats, but it seems that the production was entirely directed towards milk.

According to the average values of the indicators recorded production of goat meat Romania ranks second in the hierarchy of the countries considered in the study. The analysis for the seven States indicator taken into study allows us to rank the five countries producing goat meat, of the seven surveyed during the period 1965-2010 in three categories: very weak manufacturing (Hungary), with average production (Romania, Netherlands and France) and great production (Spain).

CHAPTER V

THE COMMERCE AND PRODUCTION VALUATION

5.1. THE IMPORT – EXPORT BALANCE IN ROMANIA AND EU STATES

From the analysis of the import - export balance value of the average cattle effectives, in studied states, it appears that it is mostly in favor for export, except...
Netherlands and Spain. Developments of different import balance – the production of meat and milk is represented by the cattle effectives average to the 1000 ha agricultural land. The pigs effectives average from exports exceeds towards imports in most countries analyzed. The import-export balance value for pork meat production is inclined for export in most EU analyzed states. The value of sheep exports is higher than imports in five of the seven EU analyzed countries from 1965 to 2010. The balance value of imports – exports for sheep meat showed a trend almost similar. Regarding the goats effectives, only Poland and Spain are characterized by import – export balance value and is favorable for import with 0.0003 $ respectively 0.0017 $ thousand. Special details for balance of import-exports values of goats effectives, are recorded in the import - export balance values of goat meat. The calculated values for $\chi^2$ are in all cases lower than the theoretical value GL = 3 and $p = 0.05$, respectively $\chi^2 = 7.78$ (see Table 5.1.). For this reason, we can affirm on mathematical basis, that, in 1965 - 2010 period the average value of livestock and productions exports are not dependent on the imports in the seven EU countries analyzed.

5.2. CATTLE STOCKS

From graphical analysis of the import - export balance value for cattle to 1,000 ha land for the period between 1965 and 2010, from seven EU countries under the study, it is noted Denmark, France and Hungary with very strong imbalance tilted in favor of exports (over an order of magnitude higher import value), and the Netherlands by more superior value compared to other countries both for import and export. From researches the Netherlands is one of the largest herds of cattle exporters, import - export balance value is tilted towards imports, which is 50% higher than the exports value in terms of value, which leads us to assert that this position is duet to the huge amounts involved (fig. 5.16.), and especially the experience in the meat processing cattle. Regarding Romania, although as noted, she is the second lowest in the hierarchy of EU countries studied in terms of value of exports of cattle to 1,000 ha of agricultural land, the balance is tilted more towards export, equal to the average throughout the period of 2690 $ to 1000 ha of agricultural land to import value amounted only to 0610 $ to 1000 ha of agricultural land.
Fig. 5.16. The evolution of the average cattle imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field

5.3. CATTLE MEAT

On mathematical basis, we can classify thus the seven EU countries analyzed in this study, in the following manner: large exporters (Netherlands, Denmark, Poland and France), middle exporters (Spain and Hungary) and weak exporters, Romania. Also, the analysis of the balance value chart of import - export meat cattle, shows Netherlands, Denmark and Poland as the largest exporters (Figure 5.31.).

Fig. 5.31. The evolution of the average value of cow meat imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field
Romania ranks last in the hierarchy of EU countries studied in terms of cattle meat export value per 1000 ha of agricultural land, but the balance is still tilted towards exports, which, throughout all the period had an average value of 2, 21 000 $ per 1000 ha of agricultural land to the import value rose only 1730 $ per 1000 ha of agricultural land.

5.4. COW MILK

Although the average index value of export value of cow's milk is much higher in the Netherlands (32.22) in the period between 1965-2010, compared to Denmark (8.01), France (6.14) and Hungary (2.82) in the last three countries, the export of cow milk occupies the most important place in the hierarchy of the seven EU countries studied, because the average indicator for the import of milk for Netherland, which is equal to 41.57, exceeds export (Fig. 5.46.).

![Graph showing average value of cow milk imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field]

**Fig. 5.46.** The evolution of the average value of cow milk imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field

5.5. PIG STOCKS

The graphical representation of the import - export balance value of pigs shows its balanced character in most of the seven countries studied (Fig. 5.61.). Exceptions are
Denmark and the Netherlands, countries that have an import - export balance value that is tilted strongly towards export. The average level of import value of pigs during 1965 - 2010 is for Denmark 0.01 and 47.14 of exports, while Netherland import values range between 20.37 and 212.44 for export (fig. 5.61.).

**Fig. 5.61.** The evolution of the average value of pig stocks imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field

5.6. PIG MEAT

The same trends as for the pig herds are noted in the case of the import - export balance value, (Fig. 5.76.). If for the majority of the analyzed states, the scale is balanced, the exceptions are highlighted by the situation of Denmark and Netherland (Fig. 5.76.) who’s import – export balance value is strongly placed towards exports.

The average indicator of import values 532.09,14 while for Netherlands the difference between import and export is lower, but it is still remains very high, 34.41 for import and export 393.17 (5.76. ).
Fig. 5.75. The evolution of the average value of pig meat imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field

5.7. SHEEP STOCKS

The analysis of the import - export balance value of sheep, show a strong imbalance in favor of exports in most countries studied (fig. 155) respectively Denmark (0.01 to 0.11), Netherland (2.15 to 12.35), Poland (0.01 to 0.65), Romania (0.06 to 3.33) and Hungary (0.34 to 6.97). For France and Spain, the import - export balance value is balanced, tilted slightly in favor of imports (Figure 5.91).
Fig. 5.90. The evolution of the average value of sheep stocks imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field

5.8. SHEEP MEAT

The analysis of import - export balance value of sheep meat, shows a strong imbalance in favor of imports into France and Denmark. During the studied period, the French import index equal to 11.61 is much higher than that of exports equal to 0.73, similar to that of Denmark where there is an average index of import value equal to 5.34, more higher than that of exports amounting to 0.71 (fig. 5.106.).

Netherland is the only country where the import - export balance value is tilted in favor of export (import average indicator is equal to 16.46, while the export is 21.38). In the other studied EU countries, the import - export balance value - is balanced on to the majority in favor of exports (fig. 5.106.).

Fig. 5.106. The evolution of the average value of sheep meat imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field
5.9. GOAT STOCKS

The import - export balance value of goats herd highlights imbalances in favor for export in France and Netherland. The largest discrepancy between the import and export is recorded in Netherland, but in the, where the export index is equal to 0.37, compared to the import index that is equal to 0.01 (fig. 5.121.). In the other European Union studied countries, the import-export balance value - is balanced, but mostly in favor for export, only in Spain and Poland is tilted in favor of imports).

![Import vs Export Balance of Goat Stocks](image.png)

**Fig. 5.121.** The evolution of the average value of goat stocks imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field

5.10. GOAT MEAT

The analysis of import - export balance value of goat meat, shows a strong imbalance in favor of exports to France and Netherland. During the studied period, the export index for France is equal to 0.37 , much higher than that of the import, equal to 0.04, similar to the situation of Netherland, but on a smaller scale, where there is an average index of export value equal 0.14, much higher than that import index amounting to 0.005 (fig. 5.135.). The balance is tilted in favor of exports in Poland and Romania, but as value, the indexes are reduced. In Denmark and Spain the import - export balance value is tilted in favor of imports (fig. 5.135.).
Fig. 5.135. The evolution of the average value of goat meat imports and exports in studied countries, during 1965 – 2010, thousands $ by 1000 ha agricultural field

CHAPTER VI
PARTICULARITIES OF THE ANIMAL PRODUCTION IN THE VÂLCEA COUNTY. A CASE STUDY

Due to large fluctuations recorded in the development of livestock farming, but also their production during 1965 - 2010, both due to changings in political realities in Romania, but also in the demand of market, for this case study was chosen to analyze the recorded situation in Valcea, in the final time interval, during 2006 - 2010.

6.1. LIVESTOCKS

6.1.1. Cattle stocks

Analysing the actual annual average number of cattle per 1000 ha of agricultural land in Valcea County (fig. 6.1.), is found that there is a constant downward trend of their evolution, trend largely similar to that recorded nationally. Both linear and the parabolic trends of the third grade confirms the constant downward evolution of the cattle in
Valcea County, trend confirmed by the high value of the determination coefficient (fig. 6.1.), Indicating a more unfavorable circumstances increase the species in the county of Valcea, which corresponds to the situation recorded nationally.

The average value of the cattle per 1000 ha land for during 2006 to 2010, recorded in Valcea county was equal to 291,583 heads, while the national average was obtained only 199,584 heads (Table 6.2.).

Fig. 6.1. The evolution tendency of the cattle stocks in the county of Vâlcea compared to Romania, heads by 1000 ha agricultural field, 2006 - 2010

Superior with 46.12% compared to Romania in the period 2006-2010, the average of cattle stocks per 1,000 ha of agricultural land, grown in Valcea County, confirms the concerns in this country area for the to increase of species, due both occupational tradition and phdo-favorable climate for the cattle breeding livestock sector accounted for.
6.1.2. Pig stocks

Regarding the evolution of the actual annual average number of pigs stocks per 1,000 ha of agricultural land in Valcea County during 2006-2010 (Figure 6.2.) is found a constant evolution, similar, in large part, to that of the national recorded in the same period. The annual average number of Valcea pig herds registered in the same period per 1,000 ha of agricultural land was much higher than the current national, although, unlike the situation highlighted in Romania, at the end of the studied period, respectively 2010, the average of pig herd per 1,000 head equal to 483.13 ha land was much lower than at baseline equal to 752.30 ends at 1000 ha of agricultural land (Table 6.3.).

In Valcea county, the herds stocks have declined much more, more than a half in 2010, by 53.06% since 2007 and by 55.70% compared to the reference year 2006 when it reached their maximum value. In average, pig herds per 1000 ha of agricultural land between 2006 - 2010 were recorded at 680.84, being superior to those in Romania, which joined the five-year average equal to 463.14 Ends (table 6.4).

It notes that the livestock branch of rising pork in Valcea county records a more extensive development than the highlighted nationally average, 47.01% higher in terms of a normal distribution which reveals a uniform development of the sector, between temporal studied, namely 2006 - 2010 (Table 6.4.).
Fig. 6.2. The evolution tendency of the pig stocks in Romania and county of Vâlcea, heads by 1000 ha agricultural field, 2006 – 2010

Table 6.4

The average of the pig stocks in Romania and county of Vâlcea (heads by 1000 ha agricultural field), 2006 – 2010

<table>
<thead>
<tr>
<th>Issue</th>
<th>Pig stocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>România</td>
</tr>
<tr>
<td>Average</td>
<td>463.14</td>
</tr>
<tr>
<td>Standard deviation of average</td>
<td>15.44</td>
</tr>
<tr>
<td>Minimum</td>
<td>409.25</td>
</tr>
<tr>
<td>Maximum</td>
<td>463.14</td>
</tr>
<tr>
<td>V%</td>
<td>7.45</td>
</tr>
</tbody>
</table>

6.1.3. Sheep stocks

The average evolution number of sheep per 1,000 ha of agricultural land in Valcea County during 2006-2010 (Figure 6.3.) differs from that on the national level in the same period. Nationally this growing steadily since 2006 (542.13 ha land ends at 1000) until
209 (621.17 ha land ends at 1000), that the last experimental year 2010, there was a slight decrease (645.73 ha land ends at 1000).

In Valcea county, the average annual number of sheep herds recorded in the same period per 1,000 ha of agricultural land was lower than the existing one at national level, the development being characterized by a predominantly downward trend.

In Valcea county, in the studied period (2006 - 2010), the average number of sheep heads was equal to 421.09 per 1000 ha of agricultural land (Table 6.6.), representing only 56.36% from the average recorded in Romania, respectively 604.88 sheep heads per1000 ha agricultural land.

![Graph showing sheep stocks](image_url)

**Fig. 6.3.** The evolution tendency of the sheep stocks in Romania and county of Vâlcea, heads by 1000 ha agricultural field, 2006 – 2010
6.1.4 Goat stocks

The average number of goats in Valcea County per 1000 ha of agricultural land during 2006 - 2010 is higher than that one recorded nationally in each year of the period analyzed (48.94 by 1000 ha of agricultural land) until 2009 (65.93 by 1000 ha of agricultural land), and the last experimental year 2010, decreased slightly (64.80 by 1000 ha of agricultural land). In Valcea county, herds have recorded a more heterogeneous evolution (Fig. 6.4). The average goat heads was equal to 83.14 per 1,000 ha of agricultural land in Valcea County (Table 6.8).

The average number of goat heads per 1000 ha of agricultural land registered in Valcea County during 2006-2010 was 40.22%, higher than in Romania, namely 59.29 % heds (Table 6.8). Thus, Valcea county is characterized by a development of the goat sector growth much higher than nationally, although the evolution was not constant, recoding permanent fluctuations.
Fig. 6.4. Tendința evoluției efectivelor de capre în România și județul Vâlcea, de capete la 1000 ha teren agricol, 2006 - 2010

The average of the goat stocks in Romania and county of Vâlcea (heads by 1000 ha agricultural field), 2006 – 2010

<table>
<thead>
<tr>
<th>Specificare/Issue</th>
<th>Goat stocks</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>România</td>
<td>Vâlcea</td>
<td></td>
</tr>
<tr>
<td>Average</td>
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<td>83.14</td>
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<tr>
<td>Standard deviation of average</td>
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<td>Minimum</td>
<td>48.94</td>
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</tr>
<tr>
<td>Maximum</td>
<td>65.93</td>
<td>87.69</td>
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</tr>
<tr>
<td>V%</td>
<td>12.90</td>
<td>6.62</td>
<td></td>
</tr>
</tbody>
</table>

6. 2. FODDER BASE

According to Romania’s National Institute of Statistics, the forage in Valcea under the studied period, fluctuated (Fig. 6.5.). It appears that in all experimental years, the majority of forage was represented by corn, with variations between 78.92% (in 2010) and 85.44% (2006).
6. 3. ANIMAL PRODUCTS

6.3.1. Cow milk

The annual production of cow milk, obtained as an average per 1000 ha of agricultural land in Valcea county is lower than that achieved at the national level in most of the analyzed time interval. In Valcea county, during the experimental period (2006 - 2010), the average milk yield was equal to 426.93 t to 1,000 ha of agricultural land (Table 6.12). Cow’s milk production, registered in Valcea County in the same period was equal to 392.87 ± 36.67 t per 1000 ha of agricultural land, being higher by 1.36% than that one recorded in Romania, which reached an average of 387 58 t cow per 1000 ha of agricultural land and representing 92.02% of the average milk production of Valcea county during 2006-2010 (Table 6.12.). Cow milk represents the vast majority of milk production recorded in Valcea County during 2006 - 2010, which, on average, is higher than that one achieved nationally.
Table 6.12. The average of milk and cow milk production by five years (2006 – 2010) in the county of Vâlcea and cow milk in Romania (thousands t by 1000 ha agricultural field)

<table>
<thead>
<tr>
<th>Issue</th>
<th>Milk, total Vâlcea</th>
<th>Cow milk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vâlcea</td>
<td>România</td>
</tr>
<tr>
<td>Average</td>
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<tr>
<td>Standard deviation of average</td>
<td>35.86</td>
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</tr>
<tr>
<td>Minimum</td>
<td>308.14</td>
<td>273.63</td>
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<tr>
<td>Maximum</td>
<td>508.70</td>
<td>480.69</td>
</tr>
<tr>
<td>V%</td>
<td>18.78</td>
<td>9.34</td>
</tr>
</tbody>
</table>

6.3.2. Cattle meat

In terms of the average annual production of beef in Valcea County expressed per 1,000 ha of agricultural land, it appears that it is superior to that achieved at the national level in most of the analyzed time interval, during 2006 to 2010. During the experimental period 2006 - 2010, in Valcea County, the average of the beef was equal to 13.80 thousand tons per 1,000 ha of agricultural land, while in Romania it was equal to 11 340 t per 1,000 ha agricultural land (Table 6.14.), representing only 82.17% of that of Valcea county. The average cattle meat production of Valcea county during 2006 - 2010, was higher than the one obtained nationally, with 22.69%.

Table 6.14. The average of the cattle meat production in the county of Vâlcea and Romania, during 2006 – 2010, thousands t by 1000 ha agricultural field

<table>
<thead>
<tr>
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<th>Production</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Vâlcea</td>
</tr>
<tr>
<td>Average</td>
<td>13.80</td>
</tr>
<tr>
<td>Standard deviation of average</td>
<td>2.07</td>
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<tr>
<td>Minimum</td>
<td>8.12</td>
</tr>
<tr>
<td>Maximum</td>
<td>20.30</td>
</tr>
<tr>
<td>V%</td>
<td>15.00</td>
</tr>
</tbody>
</table>

XLVII
6.3.3. Pig meat

In Valcea county, the average of the annual production of pork per 1000 ha of agricultural land, is far superior to that achieved at national level in most of the analyzed time interval, from 2006 to 2010.

The average production of pork recorded in Valcea county during the experimental period 2006 - 2010 was equal to 44 570 t per 1,000 ha of agricultural land, while in Romania it was equal to 32 740 per 1,000 ha agricultural land (Table 6.16.), representing only 63.87% of that of Valcea county.

It is noted, however, large fluctuations of the average production in Valcea county (up to 54.40 thousand tons to 1,000 ha of agricultural land in 2007 and 28 010 t to 1,000 ha of agricultural land in 2010) compared with the situation recorded at national level, where the maximum average production was equal to 34 550 t per 1,000 ha of agricultural land in 2009, and the lowest was equal to 30 310 t of pork to 1000 ha of agricultural land in 2010 (Table 6.16.). The average of pork production in Valcea county during 2006 - 2010, was higher than that one obtained nationally, with 36.13%.

Its evolutionary trend (constant downward since 2007) throughout all the time interval considered (2006-2010) is opposite to that recorded nationally, where it fluctuates continually from year to year (Table 6.16.).

<table>
<thead>
<tr>
<th>Issue</th>
<th>Production</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vâlcea</td>
<td>România</td>
</tr>
<tr>
<td>Average</td>
<td>44.57</td>
<td>32.74</td>
</tr>
<tr>
<td>Standard deviation of average</td>
<td>4.56</td>
<td>0.80</td>
</tr>
<tr>
<td>Minimum</td>
<td>28.01</td>
<td>30.31</td>
</tr>
<tr>
<td>Maximum</td>
<td>54.40</td>
<td>34.55</td>
</tr>
<tr>
<td>V%</td>
<td>22.89</td>
<td>5.46</td>
</tr>
</tbody>
</table>

The average of the pig meat production in the county of Vâlcea and Romania, during 2006 – 2010, thousands t by 1000 ha agricultural field.
6.3.4. Sheep meat

Sheep meat represents a zootechnic production that occupied in Valcea County during the years 2006 - 2010 a much lower weight (expressed per 1000 ha land) than that at the national level.

During the studied period, reflected by the temporal interval 2006 - 2010, in Valcea county the average production of mutton was equal to 0.970 tons per 1000 ha of agricultural land, accounting only 25.26% of the average recorded in Romania, namely 3.840 t of sheep per 1000 ha of agricultural land (Table 6.18.).

The averages of sheep meat production per 1,000 ha agricultural land for the period between 2006 to 2010 demonstrates its revival both nationally but also in Valcea County (Table 6.18.).

Table 6.18.
The average of the sheep meat production in the county of Vâlcea and Romania, during 2006 – 2010, thousands t by 1000 ha agricultural field

<table>
<thead>
<tr>
<th>Issue</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vâlcea</td>
</tr>
<tr>
<td>Average</td>
<td>0.97</td>
</tr>
<tr>
<td>Standard deviation of average</td>
<td>0.20</td>
</tr>
<tr>
<td>Minimum</td>
<td>0.41</td>
</tr>
<tr>
<td>Maximum</td>
<td>1.62</td>
</tr>
<tr>
<td>V%</td>
<td>20.61</td>
</tr>
</tbody>
</table>

6.4. INDICES OF PRODUCTION VALUES AND TRADING

Regarding the livestock production recorded in Valcea County, the research was focused mainly on the average production of: milk and beef, pork and sheep. The analysis of these productions was performed in accordance with the farm livestock development study in the context of the crop production structure recorded in Valcea county. Taking into account the evolution of the farm livestock in Valcea County (Fig. 6.13), we find that, in terms of cattle, the number has been decreasing in range from 2006
to 2010 (Figures 6.13 a - c ) from 84.40 thousand heads to 81.40 thousand heads in 2007 and 2008. In 2009, the decrease was more vertiginous at 64.20 thousand heads, and in the experimental year of 2010 their value reaches the minimum (Fig. 6.13 d).

Fig. 6.13. The structure of the livestock in the county of Vâlcea during 2006 – 2010 (thousands heads)

Goat is the only species whose stock, excepting for a slight decline recorded in 2009, have grown compared with the experimentally year of 2006 (to 18.90 thousand
heads in 2006 to 21.10 thousand heads in 2010) with the highest value recorded in the experimental years 2007 and 2008, respectively 21.60 thousand heads (Fig. 6.13).

Horses herds had a major increase from 15.50 thousand heads in 2006 to 22.60 thousand heads in 2007 (nearly 50%), value that remained in 2008 as well, after which their number decreased continuously, in 2009 reaching the same value as the reference year 2006, and in year 2010 recording the minimum value of 8.90 thousand heads (Figure 6.13). We can also notice the normal distribution of the analyzed values, for most of the experimental range, excepting 2006 and 2010 (Table 6.20.). Between the average livestock farm recorded in year 2006 and the results for the experimental years 2007 (83,940 head), 2008 (83,940 head) and 2009 (76 640 head), the differences were not statistically assured (p <0.05) in all cases, the calculated value for the “t” parameter was lower than it’s theoretical value, even for the 5% error probability (Table 6.21.).

The average evolution of the livestock in the county of Vâlcea, during 2006 – 2010 (thousands heads)

<table>
<thead>
<tr>
<th>Year</th>
<th>Issue</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>84.78</td>
<td>83.94&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>83.94&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>76.64&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>59.50&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Standard deviation of average</td>
<td>8.48</td>
<td>10.18</td>
<td>10.15</td>
<td>7.75</td>
<td>1.49</td>
<td></td>
</tr>
<tr>
<td>Minimum</td>
<td>15.50</td>
<td>21.60</td>
<td>21.60</td>
<td>19.20</td>
<td>8.90</td>
<td></td>
</tr>
<tr>
<td>Maximum</td>
<td>185.30</td>
<td>183.10</td>
<td>183.10</td>
<td>168.00</td>
<td>119.00</td>
<td></td>
</tr>
<tr>
<td>t</td>
<td>0.020</td>
<td>0.021</td>
<td>0.204</td>
<td>0.708</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p</td>
<td>0.984</td>
<td>0.984</td>
<td>0.842</td>
<td>0.048</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6.4.1. The value structure of animal and vegetal production and agricultural services in Vâlcea County

The structural value of vegetable and animal crops, and services in the experimental year of 2006 highlights the as largest share the vegetable sector, with 62.10%, followed by the animal sector (37.70%) and agricultural services (0.20 %). During the investigation in the next year, 2007, in Valcea County it remained the same
proportion of agricultural production, were predominant is the crop production, although in absolute terms there was recorded an increase in all three indicators studied: crop production, livestock production and agricultural services. Thus, the vegetable sector accounted for 62%, the animal sector for 37.50% and the agricultural services increased slightly reaching 0.50%.

In terms of absolute values the agricultural production in Valcea county increased in the experimental year 2008 as compared to year 2007 and to 2008, but also presented a slight modification of its structure in relative terms, meaning that the vegetable production increased to 66.20%, compared with 62% in the previous experimental years and consequently the production of livestock decreased to 33.70% compared with 37% in the experimental years 2006 and 2007. A similar situation was recorded for the agricultural services in 2008 accounted with a share of 0.10%, close to year 2006 (0.20%) but much lower than in 2007, when they recorded the highest value of the entire temporary range considered.

The experimental year 2009 didn’t bring a significant change in trends of agricultural production in Valcea County, which increased slightly from year 2008, in relative terms. The weight of the vegetable production decreased from 66.20% to 64.80% in the previous experimental year, and the weight of the animal production grown up to 35.10% compared with 33.70% for experimental year 2008, and the agricultural service remained at the level of year 2008, with 0.10%.

In the last experimental year, 2010, the value of the entire production fell compared with 2008 and 2009, but was superior to the first two experimental years, namely 2006 and 2007 (Figure 6.19), but in relative terms, in its structure a change worthy of consideration has produce. The value of crop production has increased by almost eight percentage points, from 72.50% to 64.80% as recorded in previous experiments being also the highest value of the entire experimental period. Consequently the share of livestock production has experienced a significant reduction, in more than seven percentage points, reaching 27.40% compared to 35.10% in the experimental year 2009, this value being the lowest from all the temporary period studied. Regarding the share of agricultural services changes have not been recorded towards previous experimental years.
6.4.2. The animal production degree

The comparative analysis of the development level of animal producing in Romania and abroad, points out that countries characterized by a high standard of living, namely Austria (61.21%), Denmark (72.76%), Germany (63.54%), Netherland (71.36%), are characterized by a high degree of animal production which dominates, as value, the vegetable crops.

The livestock evolution in Romania between 1961 - 2010 (Tables 6.24., and 6.25.) shows that at most species (cattle, pigs, sheep, poultry) the base year with the highest production was 1985, after which the livestock production has experienced in generally a downward trend. The only exceptions concern the sheep and goat sector, where in 2010 a recovery was known. (Table 6.25.).

Table 6.24.

The livestock evolution (best year = 100) in Romania, during 1961 – 1985

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>heads</td>
<td>4530000</td>
<td>4574800</td>
<td>4859580</td>
<td>5774100</td>
<td>6285400</td>
<td>7039000</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>64.4</td>
<td>65.0</td>
<td>69.0</td>
<td>82.0</td>
<td>89.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Poultry</td>
<td>thousands heads</td>
<td>38000</td>
<td>34110</td>
<td>46172</td>
<td>58972</td>
<td>87517</td>
<td>123961</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>30.7</td>
<td>27.5</td>
<td>37.2</td>
<td>47.6</td>
<td>70.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Pigs</td>
<td>heads</td>
<td>4300000</td>
<td>6033500</td>
<td>5971600</td>
<td>8565850</td>
<td>10899300</td>
<td>14776700</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>29.1</td>
<td>40.8</td>
<td>40.4</td>
<td>58.0</td>
<td>73.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Sheep</td>
<td>heads</td>
<td>11500000</td>
<td>12734400</td>
<td>13835900</td>
<td>13929400</td>
<td>15819700</td>
<td>18636800</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>61.7</td>
<td>68.3</td>
<td>74.2</td>
<td>74.7</td>
<td>84.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Goats</td>
<td>heads</td>
<td>404000</td>
<td>743800</td>
<td>564827</td>
<td>442687</td>
<td>375000</td>
<td>754200</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>39.7</td>
<td>73.1</td>
<td>55.5</td>
<td>43.5</td>
<td>36.9</td>
<td>74.1</td>
</tr>
</tbody>
</table>

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Table 6.25.

The livestock evolution (best year = 100) in Romania, during 1990 – 2010

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cattle</td>
<td>/heads</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>89,4</td>
<td>49,5</td>
<td>43,3</td>
<td>39,9</td>
<td>35,7</td>
</tr>
<tr>
<td>Poultry</td>
<td>thousands heads</td>
<td>113968</td>
<td>70157</td>
<td>69143</td>
<td>87014</td>
<td>83843</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>91,9</td>
<td>56,6</td>
<td>55,8</td>
<td>70,2</td>
<td>67,6</td>
</tr>
<tr>
<td>Pigs</td>
<td>heads</td>
<td>11671000</td>
<td>7758000</td>
<td>5848000</td>
<td>6495000</td>
<td>5793400</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>79,0</td>
<td>52,5</td>
<td>39,6</td>
<td>44,0</td>
<td>39,2</td>
</tr>
<tr>
<td>Sheep</td>
<td>heads</td>
<td>15434800</td>
<td>10896600</td>
<td>8121000</td>
<td>7425000</td>
<td>9141500</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>82,8</td>
<td>58,5</td>
<td>43,6</td>
<td>39,8</td>
<td>49,1</td>
</tr>
<tr>
<td>Goats</td>
<td>heads</td>
<td>1017200</td>
<td>745100</td>
<td>558000</td>
<td>661000</td>
<td>917300</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100,0</td>
<td>73,3</td>
<td>54,9</td>
<td>65,0</td>
<td>90,2</td>
</tr>
</tbody>
</table>

Sursa/Source: FAOSTAT | © FAO Statistics Division 2012 | 09 December 2012

The lowest level of animal production of African states distinguishes also from the analysis of comparative graphical representation of animal production degree, Bangladesh and Burundi occupying the last place in the studied hierarchy. (Fig. 6.20.).

If we particularly analyze the evolution of the animal production degree in Romania, it appears that in the first analyzed period time respectively 1965 – 1985, it recorded a fluctuating trend in the range of 34.32 to 42.97% of the total agricultural sector (Table 6.26. fig. 6.21.).

It is noted that both at the beginning and end of the time interval under study, namely 1965 - 1985, the animal production degree has represented 34.32% of the agricultural sector and the maximum weight equal to 42.97% has been achieved in year 2007. In the second part of the analyzed temporal interval, respectively the period between 1990 and 2010, the animal production degree in Romania occupied a higher percentage compared to the previous period. This was within the range 38.28% - 45.36% (see Table 6.26. Fig. 6.21.).
The highest degree of animal production was recorded in 1990 when it reached the weight of 45.36%, and then recorded mostly a downward trend, the minimum was recorded at end of the studied period, respectively 38.28% in 2010 (Table 6.26., fig. 6.21.).

**Fig. 6.20.** The animal production (%) in experimental year 2010 in studied states

**Fig. 6.21.** The animal production (%) in experimental year 2010 in Romania
The only deviation from the downward trend was recorded in 2000 (Table 6.28, Fig. 6.21), when the animal production degree increased from 41.01% to 42.94% in 1995 and then continued to decline (39.14% in 2005). According to data published by the National Institute of Statistics, shown in (Fig. 6.22), the period of 1990-1997 was characterized by a continued reduction in livestock.

![Graph showing the evolution of the agricultural production structure (1950 – 2004)](image)

**Fig. 6.22.** The evolution of the agricultural production structure (1950 – 2004)

6.4.3. Farm facilities, technology, and capital in Vâlcea county

The number of farm machinery necessary to agriculture is low. Thus, a household has tractors 46-55 hp, 18 households, which correspond to five legal entities have 56 -65 hp tractor, 22 households that also correspond to the five legal entities in possession 22 plows for tractors, 50 households benefit of animal-drawn plows, 24 households which correspond to eight businesses have all kinds of mechanical traction harrows and a household of three persons who are responsible businesses have a combined.
CONCLUSIONS

Trends in livestock rising

- Regarding the livestock production trends in Romania, there is a coherence for this sector’s policy development until 1985, for cattle herds (520.50 heads per 1000 ha agricultural land), sheep (1378.20 heads at 1000 ha agricultural land) and pigs (1092.70 heads at 1000 ha agricultural land), and for goats (75.20 heads per 1000 ha agricultural land) until 1990.
- Thereafter a decline is recorded, which has experienced a revival in 2010 for sheep (676 heads per 1000 ha agricultural land) and goats (67.80 heads per 1000 ha agricultural land), which brings optimistic outlook for these livestock branches.
- The most coherent agricultural policies were registered in Netherland, a country which with the exception of goats sector, has showed a steady upward trend mostly during the analyzed period, resulting in higher effectives per 1000 ha of agricultural land in 2010 compared to 2005 (2073.20 heads of cattle in 2010 compared with 1981.30 heads in 2005, 184 heads of goats in 2010 compared to 156.50 heads in 2005 and 6391.50 pig heads in 2010 compared to 5841.20 heads in 2005).

Trends in animal production

- Across the EU studied states, Netherland stands first place, who excepting the goat meat production (for which Spain showed the largest production capacity), ranks first in respect of all other productions.
- In this context, Romania is characterized by the lowest production for beef, pork and milk from cattle, giving better results in what concerns the sheep and goat production, a revived sector in our country in the last decade.

Commerce and production valuation

- Analyzing the value of import - export balance for average cattle herd in studied states; it appears that this is mainly for export, the exception being represented by Netherland and Spain. Netherland is characterized by the highest value of average cattle herd imports per 1000 ha of agricultural land, respectively $
68.3455 thousand, while Romania is characterized by the most balanced import-export value of average cattle herd per 1000 ha of agricultural land, the difference between imports and exports are the lowest in the series of EU analyzed countries, equal to $2.0810 thousands in favor of exports.

- Because of the large fluctuations recorded in the development of livestock farming, and in their production during 1965 - 2010, both due to the political changings in Romania’s realities, and the market requirements, for this case study it was chosen the analysis of the situation recorded in Valcea County, in the final time interval, between the period 2006 - 2010, equal to $2.0810 thousand in favor of exports.

Livestock, and the animal production degree in Vâlcea County

- Analyzing the actual annual average number of cattle, pigs, sheep and goats to 1,000 ha of agricultural land in Valcea County is found a constant downward trend of their evolution, trend largely similar to that one recorded nationally.

- The forage base consisted of the main agricultural products per person registered in Valcea county during the period under study, that between the years 2006 – 2010, has fluctuated. Regarding the structure share of grain production per person, we find that in all experimental years, the majority was represented by corn, varying between 78.92% (in 2010) and 85.44% (2006). The share of wheat and rye taken together, was therefore much lower. Percentages were recorded between 14.56% - 21.08%.

- The average cow’s milk production in Valcea county per 1000 ha of agricultural land is superior with 1.36%, to that achieved nationally respectively, 392.87 t milk towards 387.58 t milk and the average of the beef in Valcea County expressed per 1,000 ha of agricultural land (13.80 thousand t) is superior to that achieved 17.83% nationally (11 340 t) within the considered time interval, namely from 2006 to 2010.

- In Valcea County, the average pork production (44 570 t per 1,000 ha of agricultural land) is superior with 36.13% to that achieved nationally (32 ,74 thousand t per 1,000 ha agricultural land) within the analyzed time interval, namely 2006 to 2010.
The sheep production is an animal husbandry production that occupied in Valcea County during the years 2006 - 2010 a weight (expressed per 1000 ha of agricultural land), which accounted for only 25.26% of the existing sheep production at national level, (the sheep meat production in Valcea county being of 0.97 thousand t per 1000 ha of agricultural land compared to 3.84 thousand t in Romania.

The evolution of the animal production in Romania, show that during 1965 - 1985 it had a fluctuating trend, ranging between 34.32 to 42.97% of the total agricultural sector, while in the period between 1990 - 2010, it held a higher share, compared to the previous period (38.28% - 45.36%).

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