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FROM THE CONTENTS:

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CONTENTS

PRORURAL: PROGRAM ASSESSMENT IN AN INVOLVED ACTOR'S PERSPECTIVE

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ABSTRACT
PRORURAL- Azores Rural Development Plan - for 2007 to 2013, is the European Union rural development policy adjusted to the Azores Region and it is supported by European Agricultural Fund for Rural Development. The PRORURAL was approved by Commission Decision C (2007) 6162, on the 4th of December 2007. The PRORURAL has four center lines: 1) improving competitiveness of the agricultural and forestry sectors; 2) improvement of the environment and rural landscape; 3) quality of life in rural areas and diversification of economy; and 4) operation of LAGs, Acquisition of skills and entertainment in rural areas.
The financial implementation rate was 34% and its approval rate was about 60% as regards to plan's total allocation. This higher performance achieved in the material and financial execution was the result of the concerted effort between all entities in charges of the programmer's management and the commitment and initiative of the beneficiaries despite the economic crises period.
The objective of this research is the assessment of the PRORURAL in an engaged actor's perspective. For that, it was established an expert panel, constituted mainly by farmers. A questionnaire was made and a Strengths, Weaknesses/Limitations, Opportunities, and Threats –SWOT- matrix is presented.

Keywords: Assessment, Azores, Rural Plan, PRORURAL, SWOT analysis.

INTRODUCTION

The main objective of this paper is the assessment of PRORURAL plan according to the farmers' point of view.
The PRORURAL was approved by Commission Decision C (2007) 6162, on the 4th of December 2007 and is a part of second pillar of the Common Agricultural Policy (CAP). The PRORURAL has four center lines or axis: 1) improving competitiveness of the agricultural and forestry sectors; 2) improvement of the environment and rural landscape; 3) quality of life in rural areas and diversification of economy; and 4) operation of LAGs, acquisition of skills and entertainment in rural areas.

The improving competitiveness of the agricultural and forestry sectors (axis 1) has the following tools:
1.1. Professional training and information actions.
1.2. Establishment of young farmers.
1.3. Early retirement.
1.4. Management and advising services (agriculture and forestry).
1.5. Modernization of agricultural holding.
1.6. Improvement of the economic value of forest.
1.7. Adding the value of agriculture and forestry product.
1.8. Cooperation for the promotion of innovation.
1.9. Creation and development of new financial instruments.
1.10. Natural disasters.
1.11. Improvement and development of infrastructure.

The instruments of the improvement of the environment and rural landscape (axis 2), are:
2.1. Maintaining of agricultural activity in Less Favored Areas.
2.2. Agri-environment payments and Natura 2000.
2.3. Support to non-productive investments.
2.4. Management of forestry areas.
The tools of quality of life in rural areas and diversification of the economy (axis 3) are:
3.1. Diversification of the economy and creating employment in rural areas.
3.2. Improvement of quality of life in rural areas.
3.3. Training and information.
The tools of Leader approach (axis 4) are:
4.1. Execution of local development strategies.
4.2. Cooperation LEADER.
4.3. Operating of the LAG´s, acquisition of skills and entertainment in rural areas.

Table 1. Number of projects in PRORURAL, in the center lines 1 to 4

Center lines:	Nº	%
1. Improving competiveness of the agricultural and forestry sectors	56	70
2. Improving of the environment and rural landscape	1	1.25
3. Quality of life in rural areas and diversification of the Rural economy	22	27.5
4. Leader approach	1	1.25
Total	80	100

Source: (PRORURAL, 2011)

The most demanded measures were in the center line 1, improving competiveness of the agricultural and forestry sectors (70%) and in the center line 3, quality of life in rural areas and diversification of the rural economy (27.5%) *(Table 1)*. The center lines 2, improving of the environment and rural landscape and 4, Leader approach, only had one project (1.25% each one).

Table 2. Number of projects in PRORURAL, in the center lines 1

Center line 1:	Nº	%
1.2. Establishment of young farmers and 1.5. Modernization of agricultural holdings.	29	51.8
1.3. Early retirement	4	7.1
1.6. Improvement of the economic value of forest	5	8.9
1.7. Adding the value of agriculture and forestry product	9	16.1
1.11. Improvement and development of infrastructure	9	16.1
Total	56	100

Source: (PRORURAL, 2011)

Both tools, Establishment of young farmers (1.2.) and Modernization of agricultural holdings (1.5.), represent more than one half (51.8%) of the investments in the center line 1 *(Table 2)*. The adding the value of agriculture and forestry product (1.7.) and the Improvement and development of infrastructure (1.11.) were the second most important measures (16.1% each one). The less important measure in axis 1 was Early retirement (1.3.) (7.1%)

Table 3. Number of projects in PRORURAL, in the center line 3

Center line 3:	Nº	%
3.1 Diversification of the economy and creating employment in rural areas	12	54.5
3.2. Improvement of quality of life in rural areas	10	45.5
Total	22	100

Source: (PRORURAL, 2011)

The Diversification of the economy and creating employment in rural areas (3.1) were an investment option for 54.5% of total investment of center line 3 and the improvement of quality of life in rural areas (3.2.) were 45.5% of the total number of projects *(Table 3)*.

MATERIAL AND METHODOLOGY

The assessment of PRORURAL is made by a panel of 44 farmers involved in the program.
It was conceived and applied a questionnaire to the panel, inquiring their personal vision of the assessment of PRORURAL program.
The questionnaire was divided in three parts: the first one had four questions which inquired four alternatives about their opinion of the strengths, weakness, the threats and opportunities of the PRORURAL program. This part had allowed led to the SWOT matrix. The second part was the axis tools assessment. It was used an ordinal scale with 5 points: 1 (bad); 2 (fair); 3 (good); 4 (very good) and 5 (excellent). The answers were analyzed using statistics, such as, maximum and minimum value, average and mode with the objective of identifying the best and worst tools in the axis. Finally, the third part had additional information, such us, year of birth, profession, level of education, and place of living; used to characterize the social profile.
The SWOT matrix is a tool very much used in the assessment of programs (MENON ET AL., 1999). The SWOT analysis is a strategic planning method used to evaluate the internal environment: Strengths, Weaknesses/Limitations and also the external environment: Opportunities, and Threats involved in a project or in a business venture. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieve that objective (TEIXEIRA, 2005 AND 2011). The SWOT matrix will allow achievable goals or objectives to be set for the organization. The strengths are the characteristics of the business or project team that give it an advantage over others. The weaknesses are characteristics that place the team at a disadvantage (limitations) relative to others. The opportunities are external chances to improve performance (greater profits) in the environment. Finally, the threats are external elements in the environment that could cause trouble for the business or project.
The major importance of SWOT matrix is to point the strenghts and weak points, to realize the opportunities and threats and to express a strategic direction. The SWOT analysis may be used in any decision-making situation when a desired end-state (objective) has been defined. Examples include: non-profit organizations, governmental units, and individuals. SWOT analysis may also be used in pre-crisis planning and preventive crisis management. It has also being used in creating a recommendation during a viability study/survey.
In agriculture field the SWOT matrix is useful as a data qualitative analysis, as it can be find in some researches (TIBÉRIO ET AL., 2008) but also in professional training (VINHA AND LIMA-SANTOS, 2010).

RESULTS

The survey comprised a total of 44 valid questionnaires. The questionnaires were from Terceira (59%) and S. Miguel (41%) islands. About 90.9% were male and 9.1% were female. The age average of people inquired was 38 years old (21 was the youngest and 58 was de elder). The average years of education was 10 and ranges from 4 to 19 (master degree). The co-financing contribution of European and Azorean programs in average were about 65.6% (the maximum value were 81.9% and the minimum value was 54.5%).

In *Figure 1* we can find a graphic with Axis 1, the improving competitiveness of the agricultural and forestry sectors, of PRORURAL. The best results were the following measures: 1.8. Cooperation for the innovation promotion (93.5% of each positive answer, which means equal or upper than fair); 1.7. Adding the value of agriculture and forestry product and 1.11. Improvement and development of infrastructure (93.4% of each answer was equal or upper then fair); 1.9. Creation and development of new financial instruments (93.1% of each answer was upper equal or then fair); and 1.10. Natural disasters (93% of each answer was equal or upper then fair). The best Excellent scores (5) were obtained by 1.5. Modernization of agricultural holding (9.7%) and 1.7. Adding the value of agriculture and forestry product (9.4%); and 1.8. Cooperation for the promotion of innovation (9.3%).

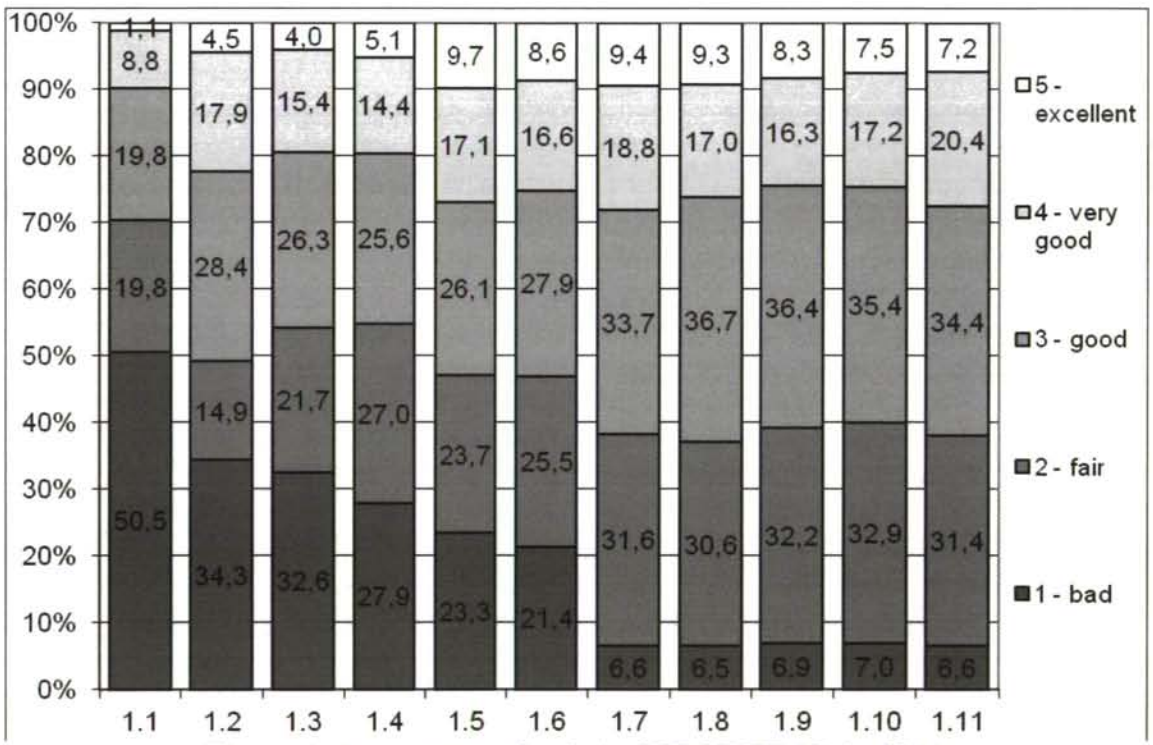

Figure 1. Assessment of axis 1 of PRORURAL in 2011

In the central line 1, the worst results were *(Figure 1)*: 1.1. Professional training and information actions (about of one half, 50.5% had answered badly), 1.2. Establishment of young farmers, (34.3% of bad score), 1.3. Early retirement (32.6% respondents had chosen a score 'bad'), and the tool, 1.4. Management and advising services - agriculture and forestry (27.9% respondents had scored 'bad').

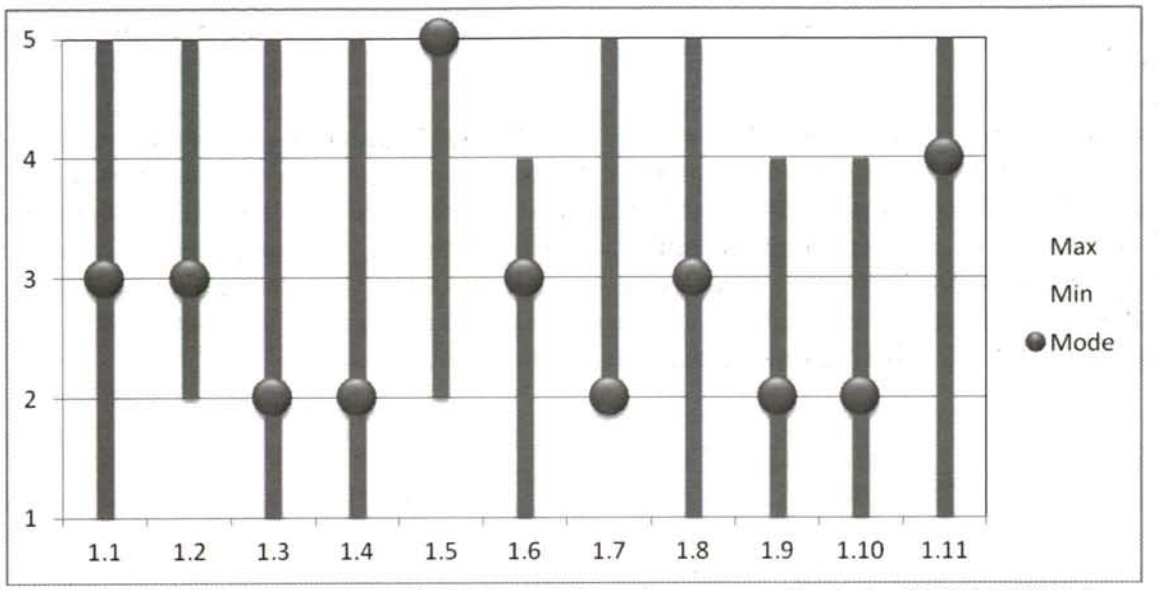

Figure 2. The maximum, minimum and mode scores of axis 1 of PRORURAL

The tools with the maximum grade (5) are: all tools in the axis 1, except 1.6. Improvement of the economic value of forest, 1.9. Creation and development of new financial instruments, and 1.10. Natural disasters *(Figure 2)*.
With the minimum grade (1) we can find on *Figure 2*: all tools in the axis 1, except 1.2. Establishment of young farmers, 1.5. Modernization of agricultural holding, and 1.7. Adding the value of agriculture and forestry product.

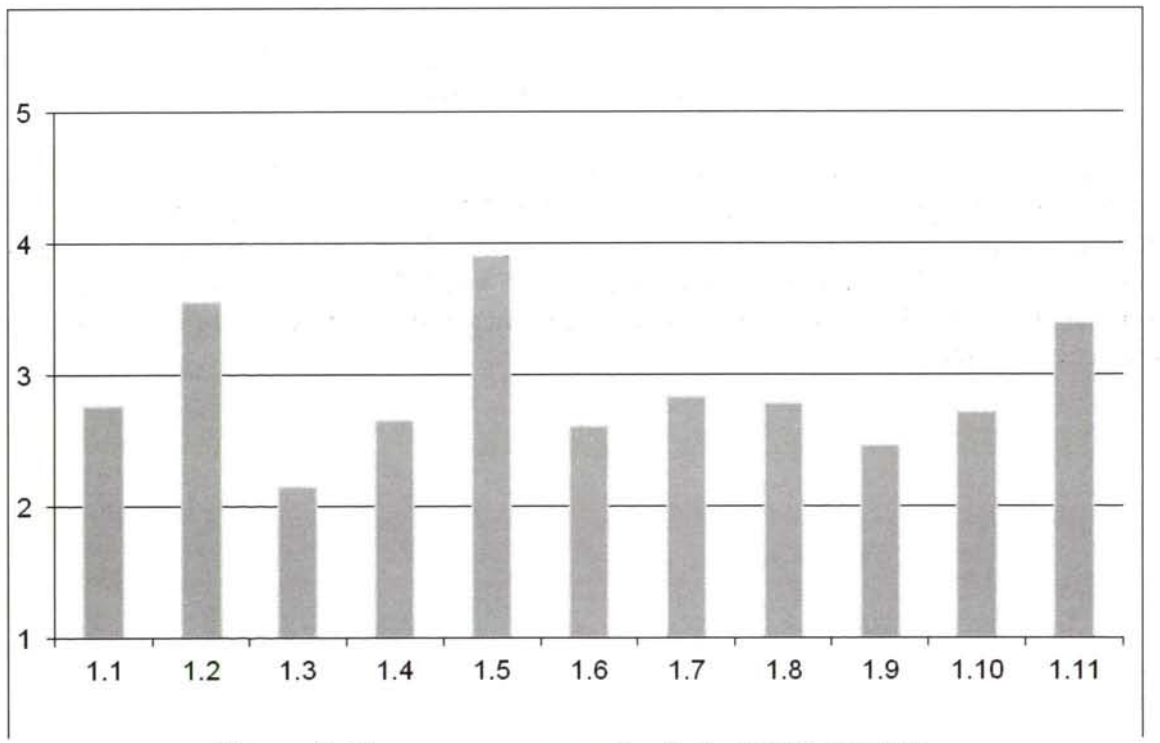

Figure 3. The average score of axis 1 of PRORURAL

The best average (3.7) was found in toll 1.5. Modernization of agricultural holding and the second best is the tool 1.11. Improvement and development of infrastructure (3.4). The worst average (2.0) is relative to tolls 1.3. Early retirement and 1.6. Improvement of the economic

value of forest. The best mode (5) was 1.5 Modernization of agricultural holding *(Figures 2 and 3)*.

The SWOT matrix

The most important strengths *(Figure 4)* of PRORURAL according to our research were: funding assistance (21.1% of respondents), establishment of young farmers (20.3%), competitiveness of farms (11.3%), modernization of agricultural holding (7.5%), agricultural diversification (7.5%) and improvement of quality of live in rural areas (6.8%). The other strengths mentioned in the questionnaire were: online application, animal welfare, communication, early retirement, environmental pressing, online application, self-employment; professional training and pasture renovation.

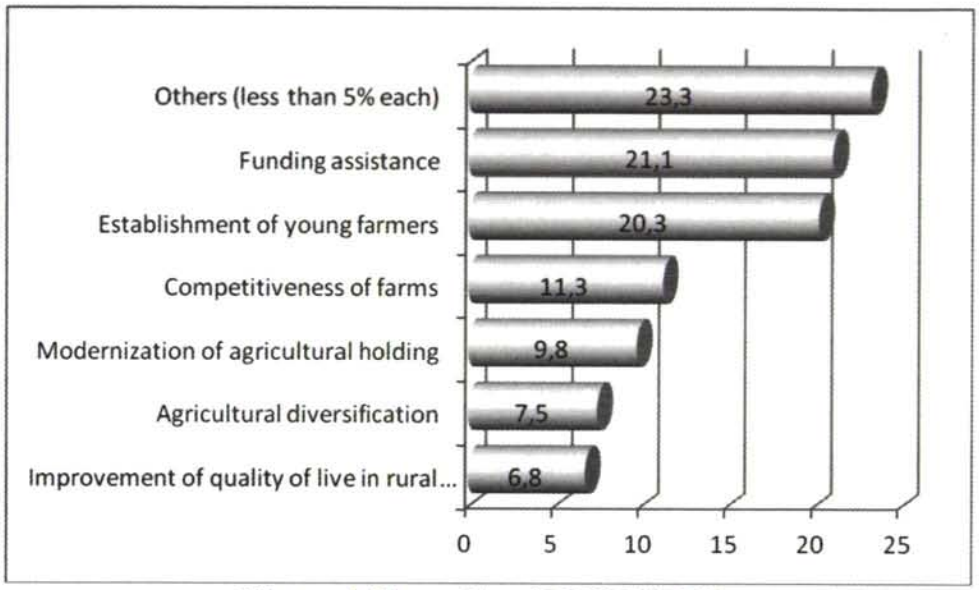

Figure 4. Strengths of PRORURAL

The most important weakness of PRORURAL was *(Figure 5)*: Beadledom (27.8% of respondents), Delays in project analysis (30.4%) and Delays in the payments (10.4%). The other weakness pointed were: No innovation, Difficulties in the first application, Degradation of rural landscape, Difficulties in bank credit, SIAFAGRI do not work well, Complexity of European rules; the Head limit eligible criteria for each tool; Dependency of own capital; and Absence of poultry support.

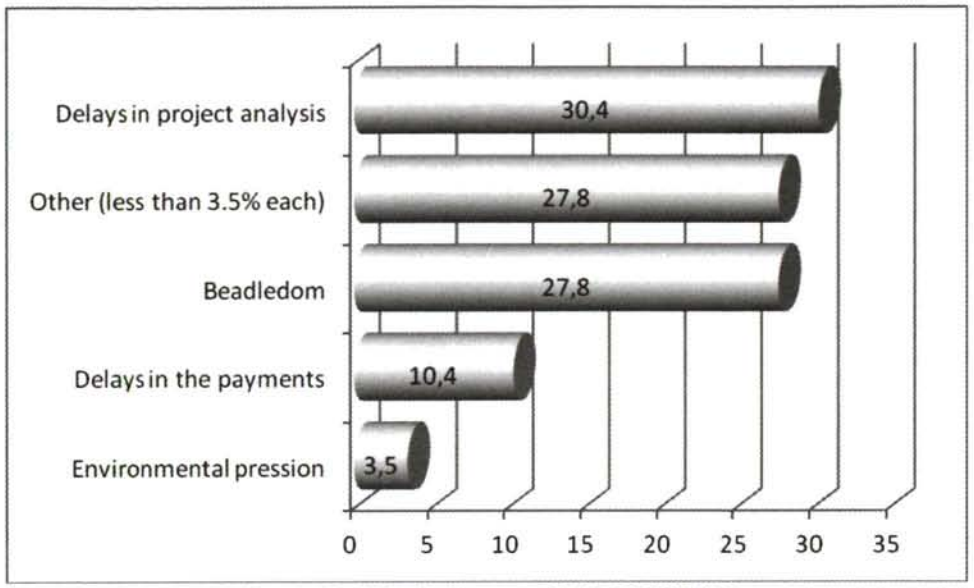

Figure 5. Weaknesses of PRORURAL

Although the answers about the most important opportunities of PRORURAL were very diverse *(Figure 6)* the ones most relevant were: Less beadledom (mentioned by 17.0% of respondents), Speeding in the payments (10.7%), Speeding in the analysis (9.8%), More communication (7.1%), Best professional training and Effluent treatment and valorisation (5.4% each one). But, the top scores are: Stop supporting the building of stables, Early retirement and Technical office support (3.6% each one).

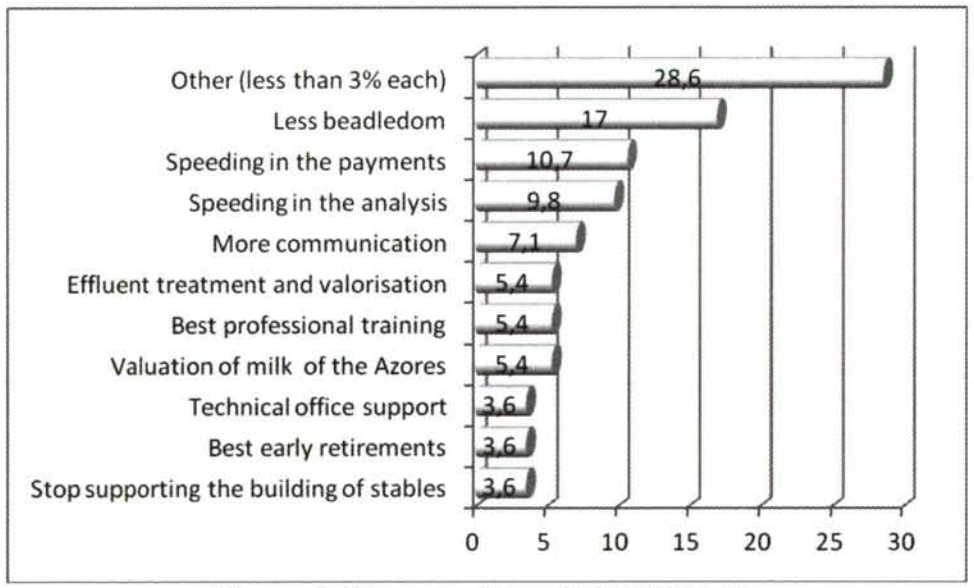

Figure 6. Opportunities of PRORURAL

The range of answers about threats were enormous, but it is possible to assort the main threats *(Figure 7)*, in the following groups: Promotion the Azorean milk (20.8%); Professional training (7.5%); Valorization of agriculture, Early retirement and Direct support (5.7% each one); More communication, Effluent treatment and valorization, Support only for young farmers, Support partial farmers and Subsidies to compensate the milk quote (3.8% each one).

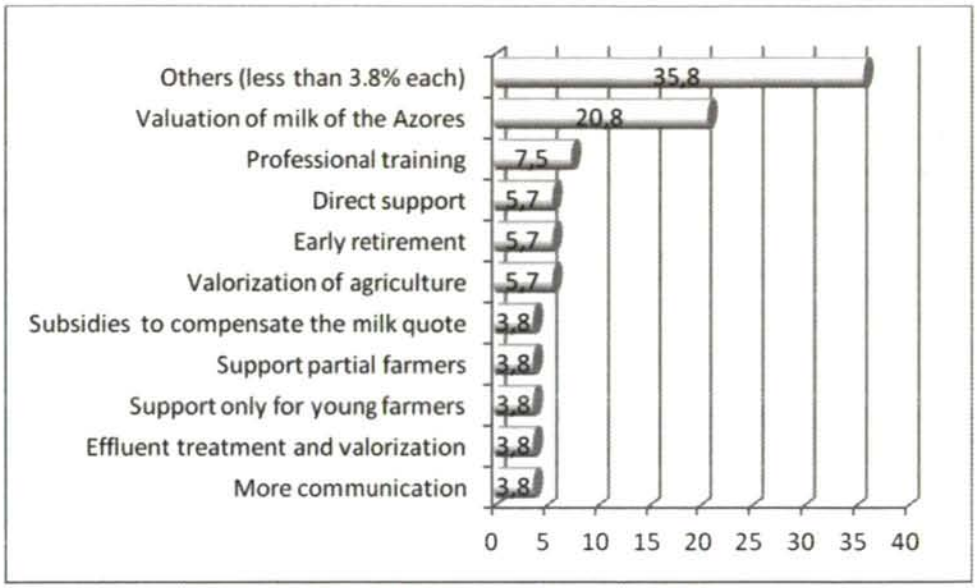

Figure 7. Threats of PRORURAL

CONCLUSIONS

We can conclude that the interviewees belief that the strengths of PRORURAL were mainly the funding assistance, establishment of young farmer and modernization of agricultural holding. The weaknesses recognized were mainly beadledom and delays in the project analysis and in payments. The threats were valuation of milk production, technical office support and professional training. The opportunities were less beadledom, speeding in the project analysis and in the payments.

According to these results it will be recommended that we need many more flexibility along with the investment project, conception and analysis. We also need to develop some tools, such as professional training and conceive the innovation and the valorization of Azorean products as an opportunity for marketing.

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THE EXAMINATION OF THE ASPECTS OF HIGHER EDUCATION INSTITUTION SELECTION IN A GROUP OF BSc. COURSE STUDENTS

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ABSTRACT
The main aim of the study was to gather information on the aspects of higher education institution selection of B.Sc. course students in the University of Szeged, Faculty of Agriculture. A survey by questionnaire was carried out among first year students about their experience in the importance of information sources of colleges and universities.
By the results it seems that the main resources for young people are the opinion of parents, relatives and friends (63%); also the internet the homepage of the university (44%) is very popular. The third in the rank is the participation on Open Days (42%), where they can get direct information and impression about the institution. Students are looking for the course specialisation, the length of the course, the scholarship or tuition fee among the admission information. Almost every answer contained remarks in the 'Others' point which means that the individual interest is broad.

Keywords: higher education, institution selection, promotion of courses, career orientation

INTRODUCTION

Career orientation is one of the major elements of preparing for adulthood. The general objective is to help students select their further schools and career. Considering the students' age and their own opportunities, the school must provide a comprehensive picture about the possibilities for further education and the world of labour. In order to achieve this, they need to provide conditions, activities, which can enhance students to try their abilities, deepen in the fields of their interests and by doing so they can develop their self-knowledge and also the knowledge of the careers. On preparing their decisions the students are influenced by a great number of effects and information in this period determining their further life.
The transformation of the economic structure induced changes in the labour market; crowds remained unemployed, and it means a need for increased training and retraining programmes, career selection, and career correction came to the forefront and career counselling got to the labour market organisations. The labour market organisations help career choice with information on labour market, training and education, thematic counselling aimed at work, career and job search rehabilitation as well as organising individual and group activities. In job centres there are clubs for job searches, psychological service and Job Information Consultancy. The continuous changes in the industry (KOMAREK, 2012) also generate a demand for modification of career and further education.
The objective of the labour market service is to support career selection decisions and finding a job. It is a problem though, that the handicapped living in a small settlement cannot use these services. WEINPER (2004) believes the efficiency of the system is hindered by the distribution of the information providing system, the capacity of counselling is scarce, the teachers are not prepared and the students have no adequate information on labour market.
The objective of the pilot programme called PHARE 2000 *'Transition from education to the world of work'* is to update and, in a wide range, disseminate (using IT) the services of the career orientation system in three regions of East Hungary. The participants in the project are

the job centres, local authorities, pedagogical institutions, regional training centres and colleges. The results of the project:

- three networks for career selection and career orientation was established;
- three hundred teachers and career orientation experts by regions were trained with up-to-date teaching material;
- effective career selection and career orientation counselling started within and outside the school system,
- the necessary infrastructure (information background and consultancy network) has been established;
- the internet counselling is operating (chat, web-camera), the harmonisation of the existing career selection information systems were started on regional level;
- the nationwide dissemination of the system is in process.

Regarding the needs for higher education they are significantly different by age and residence (IMRE, 2006). They are more levelled with the 17-year-old, where they are reflected in the different local labour market possibilities, the immediate job possibilities and the judgement of their individual future.

After 1990 the differences between schools were more open compared to the previous situation. On the one hand, the secondary grammar schools with different grade education can be formally distinguished; on the other hand they operate with declared different curricula with a variety of offers beyond the compulsory ones. One thing, however, did not change: the role of the school and qualification in determining life chances, consequently the better off parents still try to educate their children in the best schools, probably it is only the "hit accuracy" became somewhat lower (ANDOR – LISKÓ, 1999).

Students need help with finding the most suitably life career and with preparing for that, which is also society's interest. This help must be provided for students partly by the school, and partly by the external counselling institutions in the form of career orientation programmes and other professional services concerning career selection and the walk of life. While the exclusive scene of career orientation tasks is the school (and naturally the family), the various counselling possibilities belong to both the school and the labour market institutions; the need for them is determined particularly by the fact in which age it comes up. We can find examples both in the practice of the European Union (OECD, 2004) and other countries as well; nevertheless those who are jobseekers or unemployed must turn to the special network of the labour market service institutions (CSÁKÓ, 1998).

55 % of the secondary school students usually surf on the net. The educational web-sites mean one source for information concerning further education issues. The most popular sites proved to be www.sulinet.hu and www.felvi.hu, these are visited by 52 and 32 percent of the students, respectively.

According to SÁFRÁNY (2004) those who apply for university or college admission think all more and more flexible about institution selection. Students from Budapest tend to apply for university admission. Girls think significantly more flexibly about institution selection. Boys are more certain about whether to go to a university or to a college. Experience showed that the acquired certificate (e.g. GCE from a secondary technical school, which does not mean qualification, but only a successful examination) is not sufficient for finding a job in many cases (KÖRTÉSINÉ TOMCSÁK, 2007).

With regard to gender, the same traditional career orientation differences can be observed: girls tend to select arts courses, while boys prefer science (FISZ 2004). It is especially the boys who make their choice considering the reputation of the institution and also the fact whether their friends who go there. A large number of students completing the questionnaire preferred the institutions close to their residence (FELVI MAGAZIN 2007/a). According to a TÁRKI (2000) study the results show that the students in the final year of secondary

education have surprisingly correct information on the wages and salaries of jobs according to qualification and also of professions requiring a degree.
Others believe that parents and relatives have a great influence on selecting higher education institutions and also the students' background as employees, entrepreneurs or owners. It is known from sociological analyses that there is close relationship between the qualification of the entrepreneurs and the size of the enterprise (CZAKÓ ET AL., 1994).
According to the examinations of JUHÁSZ (2001) the lower, intermediate and higher level management of agricultural companies can only moderately be motivated to take part in further training and extension. Among lower level managers further training, as a possibility for promotion, is only an intermediately motivating factor. The majority of the under-educated people cannot be significantly encouraged to develop their knowledge on their field with the hope they can get further on. They should perform too much for that, although in several agricultural enterprises there is lack of well educated human resource (HORVÁTH, 2008).
We encounter similar differences in the categories of private entrepreneurs and also agricultural entrepreneurs (HARCSA, 1995), which might also cover diverse realities, from the ex tractor-driver now having a 20-30 ha family farm to the ex-co-operative leader who graduated from an agricultural university and now has an enterprise on 200-300 hectares. Agro-sociological examinations showed that the farming groups which were formed after the co-operatives ceased to exist and compensation was allocated, were rather divided. The differences cannot be originated form qualifications; it is mainly due to the starting capital gained in the hierarchy of the ex-co-operative, the ability of comprehensive overview, contact system, being well-informed and experienced (VÁNTUS, 2010; VÁNTUS ET AL., 2012). However, in the background there is the fact: 10-15 years before the regime change in Hungary nobody could have been a president of a co-operative or a member in the management without a college or university degree (ANDOR KUCZI, 1997). It seems in agriculture, too, that qualification is a better marker of the socio-economical status than the diffuse and unclear employment category. In this way the qualification of the parents indirectly influences the students' choice. At the same time CSAPÓ (1994) did not find relationship between the ideological orientation of parents and their children, therefore it seems that by the age of seventeen most the students form their own opinion about social issues.
Selecting and applying to more than one school is characteristic of those who want to try themselves in college and university level as well. All this indicated that the strategy of 'getting admission to somewhere" got more popular with the students wishing to go into higher education (KATONA, 2004).
In addition to universities and colleges, the companies involved in education were present at one of the greatest national programme called EDUCATIO International Trade Fair for Education. This exhibition is especially important for students in their final year of secondary education, since they could find and meet the representatives of all higher education institutes under one roof at the same time. They had opportunity to ask about the chances and possibilities of admission, about majors and education systems, fees and supports as well as student hostel accommodation (ANONIM, 2008).
With regard to the parents' future-orienting pedagogy and based on the research of SALLAY (2003) it can be observed that the pedagogical aims, attitudes and styles are focused mainly on the territory of hopes and fears concerning the family.
The role of teachers and friendly school communities in decision-making is indicated well by the results of the research of JÁMBORI (2003); the better the atmosphere was in a secondary school class and the more the students could rely on each other, the better chances they could see for reaching their future goals in higher education and later in the workplace. Career

selection is a decision made by parents and students jointly, as a result of a relatively long process, and in the end the family determines which institution is worth selecting for their expectations to be fulfilled (LISKÓ, 1998). Career selection used to be easier. The family, the relatives, closed communities and a traditional society system helped make a decision. Today consultancy is recommended as well (FELVI MAGAZIN, 2007/b).

To maintain the continuous operation, the University of Szeged, Faculty of Agriculture makes significant efforts for recruiting students. The constant improvement of the PR activities depends on two basic factors. One is the advertising strategies of the institutions providing the same education and the other is the total of the information and activities influencing the decision of the students selecting institutes of agricultural education.
In the recent study answers were looked for to the following questions:

- Which are the influences that affected the students to select this institution?
- Are the visits and presentations held in secondary schools effective?
- What kind of information the students considered important to know about the higher education institution they planned to select?

MATERIAL AND METHOD

Based on long years experience, regular talks with students and also on the data of the literature to set a hypothesis was tried at the beginning of the work in connection with the questions of the survey. The research concentrated on the following issues:

- It is probable that in case of the questioned students the institution selection was influenced by the opinion of relatives and acquaintances, but especially by the opinion and information from friends.
- It is supposed that the students listening to the student recruitment presentations find this career-orienting activity particularly important and it affected their career choice decision.
- The duration of the major course and the social feedback of the degree had possibly the greatest role in the students' institution selection.
- The efficiency of the media used for encouraging and activating students was rather different as the target group of the examination cannot be reached in all channels with the expected result.

During the research based on the admission data first the parts of the country where the students who had selected our institution for their majors come from were analysed. Unfortunately it was not possible to contact all applicants and send them the questionnaire, due to the features of the admission system. The method is applied in the faculty for decades; and we were concerned to make it easy to complete, the questions being clear and the answers also easy to be estimated and work with.
A brief questionnaire was comprised for the first year students in full time education to find out which information helped them select an institution. The students voluntarily answered in writing (n=129). The data collection was completed in the September of the last two years.
The data procession of the results was carried out with SPSS 17.0 programme. Special emphasis was place on the collection and analysis of the answers of the 'Other' category. A number of people from the group after they completed the questionnaire were interviewed, and through these small interviews it was possible to see behind the answers to some extent and in this way to make the statistical data we obtained more perceptible.

RESULTS AND CONCLUSIONS

The composition of the students applying for admission to the University of Szeged, Faculty of Agriculture was gathered based on the location of their secondary school by counties (Figure 1). It can be observed that approx. two third of the students (65%) came from the region, which means from the secondary schools from the relative neighbourhood. At the same time the ratio of the students from the Southern Transdanubian region and also that of the foreign students was considerable.

Our faculty does not endeavour to reach a national coverage in student recruitment; however the figure indicates the territories we might strengthen the presentation, taking into account that previously much more students used to come from Fejér County.

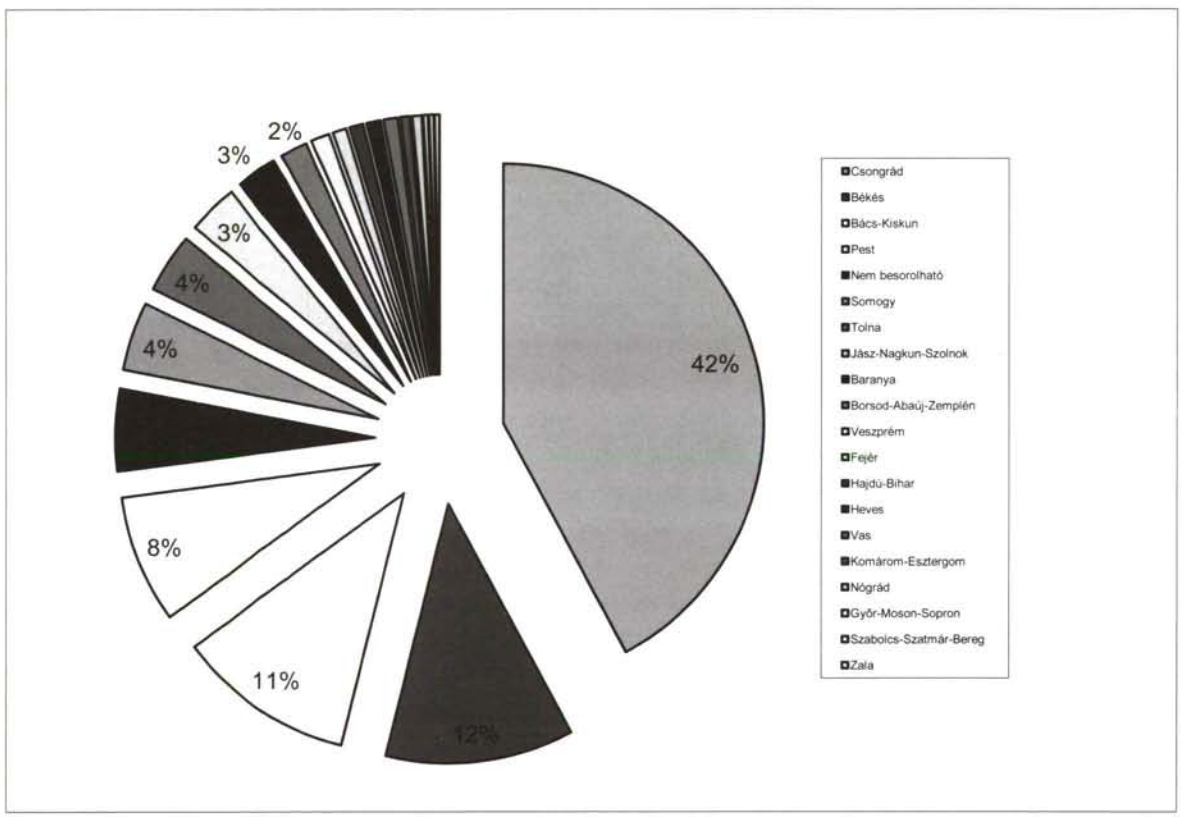

Figure 1. The ratio of applicants by counties

When selecting our institution most students made their choice based on information from relatives, friends and acquaintances *(Table 1)*. The personal conversations justified the fact that the strongest influence was reached by a person who had previous personal experience in our faculty. Such people are those whose parents or relatives graduated from our institution in Hódmezővásárhely, and had a favourable opinion about the education here. It is similarly important when the employers, for example the management of agricultural companies are satisfied with the knowledge of the graduates of our faculty.

The third most important influence in the target group was the opinion and decision of friends. Several students selected our institution because their friends from the secondary school, their classmates also came here. It is especially important in this group that they should not be disappointed with the majors they had chosen by the influence of friends and that they can fit the qualification into their further career.

Table 1. What information did you base your decision on when selecting our institution?

Source of information	Persons (%)
• Information from secondary school teachers, or form master	19
• Advertisement in electronic media	2
• Advertisement in printed press	14
• Information from relatives, friends, acquaintances	63
• Internet information, the web-site of the institution	44
• Participating on the Open Day	42
• Student recruiting presentation at the secondary school	30
• Other	26

The website of the Faculty, the Open Days and the personal visits to secondary schools also have a significant part. The continuous maintenance and development of the website is vital for the faculty. The majority of young people turn to the internet for information (electronic media and printed press are not popular with them at all) and what they cannot find on the net simply does not exist for them.

The efficiency of the media campaign, despite of the high costs, is very low. It is usually the parents who obtain their information from newspapers and other publications.

Unfortunately the influence of secondary school teachers and form masters is weaker than expected. The main reason for that is although they must deal with career orientation they do not have enough time to present all possible higher education institutions in details and they cannot offer a whole lesson for an introduction.

Among the '*Other*' answers the *'Admission Information' (Felvételi tájékoztató)* appeared several times. Some based their decision on the EDUCATIO programme in Budapest, while others on their agricultural orientation interests.

Out of the questioned 30 % listened to presentations in their secondary school. Their answers (Table 2) indicate the importance is 3.3, which means medium level.

Table 2. The efficiency (importance) of the student recruitment presentations

Value	1	2	3	4	5
%	0	8	69	8	15

The efficiency of the student recruitment presentations is doubtful as the number of students is low in schools where participation is voluntary and when it is compulsory, the number is high but the students are passive. They do not dare to ask questions in class. Their general opinion is that all higher education institutions 'paint a nice picture' in these presentations, this is why they only gave an intermediate grade. Those seriously interested in the chosen field prefer the Open Days, where they can talk to many lecturers and students; they can get to know the institution and the standard of service (grants, fees, accommodation, food, student life). Some would arrive with their parents and need information if they can get everything under one roof, while others are interested in the relationship between students (e.g. if there is an 'initiation ritual').

When selecting the institution the information summed up in Table 3 helped students make up their mind. The offered majors, specialisations and courses had significant influence in their

decision. It is a general opinion that in the filed of animal production and wildlife management majors the faculty has traditions and favourable reputation. Students indicated several factors important for themselves in the *'Other'* point.

Table 3. Information necessary to make a decision

What did you search for among the admission information?	Persons (%)
• The duration of the education	65.1
• Major/Course/Specialisation selection	83.7
• Tuition fee	34.9
• Students hostel placement	32.6
• Student life	34.9
• Other	93.0

In case of the students from this region it was important that they could study in the vicinity of their residence since more and more of them commute each day; sometimes they help on the farm and study at the same time and in case of those living in the students' hostel the lowest possible travel cost was also an important consideration.
Significant factors are:

- the grant possibilities,
- preparation for and taking a language examination locally,
- job possibilities, as well as opportunity to take part in internship programmes abroad.

Unfortunately the attendance of the language examination preparing courses, which are free of charge for our students, their activity does not reflect the result of the survey, and neither does the fact, that BA student will be able to get a degree only after they have completed their intermediate level language examination.
Tuition fee did not influence the decision of the students in the first place, which can be explained with several factors:

- most students first applied for a state financed place;
- those with paid places hope they can be transferred to the state financed category if they get excellent grades;
- tuition fees at the faculty in the research period were around 100,000 HUF, which still was regarded as a reasonable category.

Student life was mentioned by relatively few. Based on the discussions with students it might be due to the first weeks passing with orientation, getting used to the place, there is a great difference between the study methods and the requirements of a secondary school and that of a higher education institution; many do not go out in their spare time, they take up a job to earn money and everybody has their own private life instead of share their time with others.
Among the *'Other'* answers we can find the standard of education, good transport and availability, the distance from their residence, the number of points necessary for admission, practical training and its standard, the possibility of taking part in other types of diploma courses, sports facilities, restaurants and entertainment facilities

Based on the results of the examination the following conclusions can be drawn and the suggestions can be made for the practice:

- although the three counties of the Southern Great Plain region are the most important area for us considering enrolment, we must not give up student recruitment in those

places where the number of students applying for admission to the faculty considerably grew or suddenly fell back;

- the costs of mass media advertisements for the information of secondary school students can be reduced, at the same time the faculty web page must be developed considerably and also the content of the career orientation presentations at the secondary schools and also the Open Days at the Faculty must be improved;
- we can and also must rely on the opinion-shaping role of the agricultural experts in the region, who can recommend our faculty, based on their personal contacts or experiences, as parents, relatives or acquaintances of the applicants;
- the issues of tuition fee, grants and subsidies for students must be detailed in the information brochures, publications and presentations, despite the fact that the present sum of the tuition fee is not deterrent;
- it was obvious from the conversations with students that most applicants did not focus on student life and entertainment when making their choice.

Students can be grouped as purposeful selectors and not purposeful selectors. For those who selected purposefully it is important their degree should be competitive. Considerable but not determining numbers of students are willing to pay to obtain a degree. The opinion of the students can be influenced by media in positive and negative direction as well, for instance they read mostly tabloids and sports papers *(Blikk, Nemzeti Sport)*. The next most popular source of information is teachers, the Admission Information and their friends from school and those who have already applied for admission.

During the conversations it turned out that in case the parents cannot finance the cost of the full time course, the students select a correspondence course and get a degree with studying after work. Many would like to take the "student loan" but they are not sure at all if they can find a job and be able to pay back the loan after graduating. Few students have language examination certificate when applying for admission, and they highlighted they expected difficulties in passing the intermediate level language examination.

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NATURAL, SOCIAL AND ECONOMIC EXAMINATIONS OF ECOVILLAGES FOCUSING ON A CERTAIN EXAMPLE

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ABSTRACT
Nowadays mankind has to cope with the fact that we will sooner or later run out of our resources. As a possible farming and living alternative the concept of forming ecovillages may arise as establishing a smaller community being sustainable from social, natural and economic aspects, where the population has similar social, ecological and spiritual views. In our study we wish to introduce the situation and characteristics of an already existing ecovillage reflecting an alternative developing example to communities of similar situations. The ecological-environmental, social and economic conditions of Gömörszőlős, the major blocking factors in operation and possible developing tendencies of ecovillages will be detailed. Local products of good quality, relaxed, natural environment may motivate someone to become an inhabitant of an ecovillage. The most important motivating factor, however, is the environmental friendly way of thinking. The biggest problems include strict legal regulation and lack of local jobs, difficulties to get financial subsidies, aging population of decreasing number. The most important objective in an ecovillage and in other communities is the fact that the inhabitants should have the willingness of environmental consciousness in every-day life, of using ecological equipment as these constitute the essence of ecovillages.

Keywords: ecovillage, Gömörszőlős, sustainability

INTRODUCTION

Nowadays terms of economic crises, sustainability, eco-products, arrangement to self-consuming arise more often in every-day life. Thank to mainly the media these terms and concepts have greater and greater significance as well as the identification with alternative life forms, just like moving to ecovillages. The existence of ecovillages may not be considered as a new phenomenon either in Hungary or abroad.

The eco word comes from the Greek "oikos" word, which means house, household narrowly, and completeness, wholeness, the house of the creator father in a wider meaning. If something is linked to the eco word, it means that this thing strives to affect the environment to the smallest degree, to avoid causing damages, as well as to harmonize with the cycle of the nature in order not to bother its balance (I1).

There are several definitions of ecovillages, but the essence is the same. They are smaller communities being sustainable from social, natural and economic aspects, where the population has similar social, ecological and spiritual views. One of these factors plays an important role in their foundation. In general when founding ecovillages it is true that only one of the factors had been focused on and the other factors were considered later by spreading the interests.

The Global Ecovillage Network introduces the concept of ecovillages through the metaphor of three-legged stool (I1). The seat means sustainability, while the legs reflect spiritual, social and ecological motivations. The sustainability of a community is maintained if every leg is strong and harmonized with each other (CAKE-DALY, 2009).

Firstly Robert Gilman, who was an editor of a magazine, defined the definition of ecovillages in 1991, which definition has been to become a standard. An ecovillage is a "human-scale full-featured settlement in which human activities are harmlessly integrated into the natural

world in a way that is supportive of healthy human development, and can be successfully continued into the indefinite future." (I2). Human-scale means personal acquaintance that is the dwellers know each other, which determines the number of population in a few hundred (HÁRI, 2008). Later Gilman added the fact to his ecovillage definition in 1999 that an ecovillage must have multiple centers of initiative.

Béla Boros as one of the founders of the Hungarian ecovillage movement has also created a definition for ecovillages. On this basis an ecovillage is a community which utilizes technological, social, community organizing and economic methods, which makes the development of a sustainable human community possible where the resources of the environment are used in the most efficient way (I3).

There are several success stories relating to foreign ecovillages, such as Findhorn in Scotland, Andelssamfundet in Denmark, or Sieben Linden in Deutschland. In a number of European countries, just like in Norway, sustainability and the concept of ecovillages is linked to tourism thus ensuring the spread of environmental consciousness in a wider sphere (HORVÁTH, 2009).

Previously in our research the practical realization of sustainable development altogether with rural tourism were investigated in seven communities located in the Zemplén area (SZABÓ, 2010). The investigated area is located in northeast part of Borsod Abaúj Zemplén county in the Northern Hungarian region. Though these communities belong to the most disadvantageous settlements, this area has rich natural, cultural and historical values, which may help the development of rural tourism.

Our conclusion included the facts that rural tourism may have a relevant role in founding sustainable farming and development and in spreading environmental consciousness, mainly if the activity is situated in an ecovillage. Regarding the willingness of the population and rural host for co-operation as well as the opinion of the mayors, there is a real chance for realizing the concept of ecovillages, which altogether with rural tourism may contribute to strengthening the global view and the practical realization of sustainable development in this area.

In order to make concrete suggestions and conclusions for other communities to become an ecovillage, we aim at revealing the situations of already operating ecovillages in Hungary to investigate the conditions of energy saving and environmental consciousness life and farming as well as the operating conditions of ecovillages. On these bases the conditions of establishing environmental consciousness life form may be defined to other communities in the Zemplén.

Presently there are eight ecovillages in Hungary. The basic functions of the operation of ecovillages are the same, but the aim of the creation may be different, thus they cannot be classified into one model. Among the domestic ecovillages Gömörszölős is similar to the investigated communities, in this way this ecovillage of the others is chosen for the examination in this study.

MATERIAL AND METHOD

Our research method contained personal visit and critical interview. During our personal visit, critical interview was made with the mayor, the education center, which will be later detailed, as well as several local farmers were visited. Our aim was to reveal the condition of self-sufficiency, which may be adapted to other communities having similar conditions and problems in order to become successful ecovillages, as by the fact that Gömörszőlős has developed into an ecovillage, it tries to stop depopulation and decrease unemployment (SZŰCS, 2005).

RESULTS

In this chapter the location and natural conditions, the social characteristics and the economic background of self-sufficiency of Gömörszőlős are detailed.

Location and Natural Conditions of Gömörszőlős

Regarding already operating initiatives, there are different solutions for founding ecovillages in Hungary. There are villages created from nothing, such as in case of Galgahévíz, which is located in Pest County and it was developed from the prairie (SZABÓ-LÁSZLÓ, 2011). The most typical foundation form is the solution in which ecovillages are established in already existing villages being often dead-end settlements. In several opinions, this is an unfavourable feature as it hinders further development of the community; on the other hand, it may be advantageous as well, because it may help in saving natural values. In case of Gömörszőlős this is the initiative which exists, that is the ecovillage was developed in a dead-end settlement (NAGY, 2011).

Gömörszőlős is situated in the northwest part of Borsod-Abaúj-Zemplén County in the northeast part of Hungary, at the Hungarian and Slovak border. Its natural conditions are unique. The route of the National Blue Trail crosses over the settlement to Aggtelek. It is far from the main transport roads, it may be reached by passing the route Putnok-Aggtelek. A 2-kilometer-long road from Kelemér leads to Gömörszőlős. It is characterized by peace, silence and tide environment. The settlement is first mentioned in the 18th century. Almost its whole population got by agriculture, mainly from animal keeping, and carried out farming for self-consumption. The development of heavy industry of the surrounding settlements attracted many young people from the village, which contributed to the decrease and aging of the population. In order to stop this tendency, the local group of the Ecological Institute of Miskolc (The Ecological Institute, Foundation for Sustainable Development) undertook a village developing program altogether with the local government aiming at making the village sustainable. Within this program several buildings were renovated, maintaining, saving and introducing the traditional rural life form is stimulated. Their long-term aim is to affect the view of city-dwellers and tourists, and to introduce and spread the conditions of sustainable development and life. An education center was established, where programs are organized for groups reflecting sustainability and self-sufficiency. Tourism supplements well spreading these traditions, thus accommodations, sights, supplies and authentic examples of the traditional peasant way of life are available in the village (I5).

It is obvious that environmental consciousness goes together with nature conservation. In Gömörszőlős there is the possibility for even little children to get acquainted with the relevance of environmental conservation and to study saving and respect the nature. People strive to farm without chemicals and to use environmental friendly detergents, to collect waste selectively, as well as to maintain their direct surroundings clean and organized.

Social Conditions

In general the upper limit of the population is about 200 to 300 people in case of ecovillages, as above this limit the settlement would lose its village feature, the personal acquaintance as well as the intimacy feeling would weaken. Gömörszőlős has a population of 93. The self-government does not limit the number of the population but the present aim is to maintain this number as there is not any newly born child and near half of the population is pensioner-aged. There is not any extra condition for those who wish to move in. In other ecovillages, for example in Gyűrűfű, a multi-stepped process waits for the outsiders in order to become local.

The age structure of the population and the educational level depends on the motivations of those moving to or founding the ecovillage. A common feature of ecovillages is that the educational level is higher than the average as the population undertakes a higher leveled obligation in order to save the environment. In Gömörszőlős the age structure is the following: 33% of the population is above 60, the ratio of people between 41 and 60 is 27%, while the ratio of the young below 18 is 15%. The village struggles with aging, but the ecological way of thinking, the self-sufficiency attracted several young people and intellectual families, which may help in stop this unfavourable process. There are similarly adverse processes in other part of Hungary, for example in Hódmezővásárhely subregion, where the vitality tendency is also unfavorable and the population is decreasing and aging (HORVÁTH – BODNÁR, 2009).

In ecovillages the community life is the most important motivating power, by which the everyday life of local people becomes dynamic. This is the most appropriate place for exchanges personal experiences, creativity and self-education. The healthy community life is based on the common trust and common interests get into forward instead of ego-centered thinking. People take care of each other and respect mutually each other, and their common aim is to develop a common future. Meetings are held regularly where the actual problems and suggestions are discussed. The weekdays, holidays spent together and work contribute to developing intimacy feeling and holding together in locals. By this it is easier to handle potential problems and conflicts as the common aim is the development of the community. The Village Day in Gömörszőlős is held in August in every year, which strengthens the relationships among the population. Last year this holiday was supplemented by a National Bio Day. The mayor and two member representations are responsible for making decisions regarding the community and population is involved in cases when the issue concerns the population as well.

The intellectual life and sav ing and respecting traditions are more remarkable in a small village. Gömörszőlős focuses on saving the traditional rural life form. There is a cultural association formed 50 years ago, which held several performances and concerts. Today its activity is not typical as this generation is aging. In the building and the garden of the former primary school an ethnographic collection and a small gallery were established, where seasonal exhibitions are held as the village is home of the art summer camp of the Creators' Folk High School. The ethnographic collection introduces the assets of farming and forestry as well as those of the households. Children learn how to folk dance. There are several programs organized to introduce the cultural value of the ecovillage. The education center of the Ecological Institute undertakes organizing programs such as walking in the moonlight, games relating to nature or sustainability. There is a chance to take a walk in the village altogether with a qualified guide and to take part in performances and lectures.

In an ecovillage regarding education it is an important factor that student could get to know the relevance of environmental conservation even in their childhood, and learn the limits, which should not be exceeded with our consumption. Unfortunately, there has not been any educational institute in Gömörszőlős since 1967. Due to the low number of children it was not worth maintaining it. The children go to kindergarten and primary schools of the surrounding settlements, such as Serényfalva, Kelemér, Putnok. Three young people go to university in Miskolc, Eger and Debrecen. Technical practice is organized for university students and volunteers by the Ecological Institute to introduce the conditions of sustainable living and farming. Locals call it "peasant wellness".

Economic Conditions

Private, family and small-scale enterprises in ecovillages supplement each others' activity. Local enterprises satisfy local demands in a better way, as they realizes the actual needs of the

community more efficiently. Products and services do not require advertisements, because local production meets local consumption by saving money. On the other hand advertisements do not highlight our real needs and this view is far from the thinking of ecovillages. Plant production, animal breeding and handicraft are typical to ecovillages. The activity of the inhabitants reflects diversification.

In ecovillages small amount of products are produced, but their common feature is that they are unique and of good quality. In Gömörszőlős the different economic activities were already given as the village had existed before; however, the intensity of the activities and the production volume has decreased.

Unfortunately small ratio of the inhabitants work in Gömörszőlős, as there is hardly any working possibilities in the village. Only a few persons are employed by the local public work program and two people work for the Ecological Institute. The research results of OLÁH (2012) prove the fact that public work programs do not mean a permanent solution for handling unemployment; it is just a temporary asset. The manager of the institute comes over the neighboring settlement and the shop assistant is not a local inhabitant either. Six persons commute to work to other settlements, as workmen, engineers or mayor in Kelemér. There is a retailer entrepreneur in the village dealing with transporting artificial tubes and drains, and even a handicraft family live in the village.

Animal breeding is characterized by sheep breeding, 5 families keep pigs and few families keep goats. The meat is sold inside the village. The major part of the population purchase meat from the local grocery. Regarding processing there is a wool processing firm thank to the Foundation for Sustainable Development. By the help of the machines of more than one hundred years it produces wool and thread. A traditional wool dyeing and sewing small factory belong to the firm. The products may be visited and purchased; moreover, one can join a felting course by prior arrangement. There is a carding firm operating in the village where the carded wool is sold. Three families have grasslands, hired and own ones. In case of vegetable and fruit production the village is self-sufficient. Cauliflower, carrot, cucumber, pumpkin are typical vegetables in the village. Plum palinka and jam made from local plum are popular. A family deals with making homemade noodles and plans to produce goat cheese in the future. Regarding services, such as haircut, renovation, woodwork, barter is typical among the inhabitants. This system operates well in the village as people know each other personally. The purchase market of bio-products is not appropriate in Borsod-Abaúj-Zemplén County; the qualification is expensive and the demand is insufficient. In this way there is not any trading quantity produced in the village. Though a biogarden is cultivated in Gömörszőlős, products are used for self-consumption.

Though the community is partly self-sufficient, relating to meat production or other different every-day used objects, the village strives to become a self-sufficient community similarly to other ecovillages in Hungary.

The aim of the Education Center of the Ecological Institute is to form the view of the young generation, to develop the ecological culture and to spread knowledge relating to sustainability. It organizes courses and programs for domestic and foreign children, for junior and senior groups. The Education Center consists of a lecture room and provides accommodation, which introduce the environmental friendly heating and sewage management solutions as well as the opportunities of composting, using solar collector and utilizing rain-water. The real advantage of this program is not the profit from the economic aspect but primarily the development of the local society and saving the environment. The Center tries to involve more and more people without focusing on profit.

Ecovillages are visited by tourists who prefer the closeness of nature. Every ecovillage has accommodations for the visitors, but often without technical achievement and luxury. The main attractive powers contain environmental consciousness, nature and community feeling.

The Education Center in Gömörszőlős is suitable for hosting 20 to 25 visitors with prior arrangement. The number of visitors in a year is near 2000 tourists. Besides the accommodation served by the Education Center, there is also a rural host, who can accommodate 10 persons in the house comfortably. The family earlier dealt with farming for self-consumption and has saved the buildings and assets for those who are interested in. The touristic potential is appropriate in Gömörszőlős, the available accommodation are comfortable serving the basis for the development of the tourism in the ecovillage.
Regarding infrastructure, the village has a dead-end, as it was previously mentioned. The houses are traditionally built; the road is concrete along the village. People strive to minimize their energy consumption, to produce less waste and try to be independent from other settlements. Alternative solutions come forward in the every-day comfort. Every ecovillage uses renewable energy sources, utilizes solar energy gained by solar collector, and uses biomass and wood chops for heating. The solar collector is located at the top of the building of the Ecological Institute. It is used for produce warm water. 80 to 90% of the utilized energy in the village may be considered as renewable. In Gömörszőlős water pipe and sewage system are developed and there is a local ecological cleaning power in the village. Only few families joined the gas pipe system. Telephone net system has been operating, while regarding internet, only wifi is available. The Education Center has a wood gazing furnace. The electricity is provided by the North Hungarian Electricity Service Company.
Water is gained from own wells in most of the yards. In the main square of the village there is a well house, out of order, which was renovated for fountain. There were clear creeks in the grasslands, and the Ecological Institute plans to clean these sources. Water in the wells and the collected rain-water is used for irrigation. As the sewage pipe system is developed in the village, the homemade willow sewage cleaning system was ceased. It had operated for 20 years in the village. It was cheaper and more reliable, and it was a natural and environmental friendly way of managing sewage. However, this method is not subsidized by the state.
The inhabitants collect wastes selectively. They strive to reutilize the collected wastes. For example earlier old rags were used for making blankets.
When building houses, traditional building materials and techniques are used in ecovillages. Local wood, clay, stone are used thus transportation cost does not arise. Houses made from natural materials are healthier, insulate well, keep the moisture content of the air in an appropriate state and do not emit harmful radiation. Such well maintained houses may be lived for several hundred years. There is not any newly built house in Gömörszőlős. When the presently existing houses were built, the village had not been qualified as an ecovillage yet. The settlement has almost 50 buildings, which are traditionally built peasant houses from wood, adobe and brick. All in all, houses in ecovillages may be maintained by lower maintenance costs.

CONCLUSIONS

Our conclusions may be divided into two parts. Firstly, strengths, weaknesses, opportunities, threats, major blocking problems and most important objectives for possible developing tendencies are detailed relating to the examined ecovillage. All these may reflect the necessary natural, social and economic conditions for similar settlements wishing to become ecovillages, which constitutes the second part of the conclusions.

Strengths, Weaknesses, Opportunities, Threats, Problems and Objectives

The strengths make Gömörszőlős and other ecovillages attractive for people. Local products of good quality, relaxed, natural environment contribute to stress-free life. These are the

factors that may motivate someone to become an inhabitant of an ecovillage. The most important motivating factor, however, is the environmental friendly way of thinking.
Weaknesses include few working opportunities in the village. There is hardly any new incoming entrepreneur. Isolation and the difficult approach are rather disadvantageous factors, which should be considered when moving in. Comparing to other ecovillages, the houses are old but in a good state. The purchase price of environmental friendly technologies is high, thus it is not typical to households to use them. Mainly buildings of the local government have such technologies.
It is favourable for the future that ecological thinking and sustainability is getting to spread and all these may be motivating factors for people. The demand for bio products of good quality is increasing, and ecovillages just like Gömörszőlős may be potential markets for biofarming.
The aging population, the lack of young generation and the less population are threatening the future of the ecovillage.
On this basis the biggest problem which hinders the development of Gömörszőlős is the strict legal regulation for ecovillages. The development of ecovillages may be realized from financial sources from applications, though the administration makes this process slower. Little information for inhabitants of ecovillages forms another problem, which comes from mainly the isolation. Other basic problem is the small-rate or lack of environmental consciousness in every-day people. There is hardly any information on ecovillages, many people do not know even about their existence, which generates the small number of visitors and the unused touristic potential. Tourism is present in Gömörszőlős but its efficiency should be improved by making the village and the ecological way of life more popular.
The deficiencies of the infrastructure are also a major problem. The houses are old, there is not any entrepreneur moving in improving the economic life of the village. The number of local working opportunities is small, which causes commuting or emigration. The population is aging and decreasing.
Though Gömörszőlős strives to use renewable energy sources and environmental friendly technologies, their purchase prices are high. The solvent demand is low even in this settlement.
After detailing the problems, the major objectives may be determined which help the sustainability and more efficient operation of Gömörszőlős.
The most important objective in an ecovillage and in other communities is the fact that the inhabitants should have the willingness of environmental consciousness in every-day life and using ecological equipment as these constitute the essence of faith in ecovillages. This needs to apply for financial subsidies because of the high purchase prices and which could cover the expenses of improving even the infrastructure aiming at easing the isolation and making the approach more favourable.
Regarding bio-products of good quality, a local farmers' market may be a good solution contributing to the increased number of visitors. The development of tourism is a complex objective helping it by establishing and improving the relating facilities. These facilities would ease not only the life of local population and serve working opportunities, but may make the village attractive even for tourists. Stimulating enterprises for moving in the village is expected, which would increase local jobs for the inhabitants as creation and maintenance of local jobs are complex objectives.

Necessary Natural, Social and Economic Factors

It is obvious that several natural, social and economic factors are necessary for a village to become an ecovillage or for an ecovillage to operate efficiently.

The most important natural factors are the closeness of nature, clean and organized environment, which may contribute to evolving an inner intent in people to respect, love and save the natural values and furthermore to helping in spreading environmental consciousness. Social factors include a strong community life, saving traditions, culture and rural life form and environmental consciousness, which should be strengthened even in the early childhood through education.

From the economic aspect subsidies may help in using renewable energy sources and environmental friendly technologies to a greater extent. Bio-farming utilizing native animal and plant species, processing local bio-products, maintaining local farmers' market help in creating local jobs, deceasing unemployment and commuting and developing the intention of inhabitants for self-sufficiency. In a long run the aim is to become independent from the aspects of mainly food and energy production. Infrastructural elements such as natural way of managing sewage, collecting waste in a selective way are important factors even from the ecological aspect, just like using natural materials when building houses. Developing tourism may cause positive effects in the future both for the community and for tourists. The increase of the number of visitors, however, is problematic, as intensive tourism contradicts to saving environmental values.

All these may improve the ecological, social and economic functions of rural areas and contribute to recovering from crisis and developing of settlements of similar conditions.

In our opinions the population does not have to live in an ecovillage by all means in order to focus on our consumption and to produce fewer wastes. The issue of saving our environment is not just a social or an economic consideration; it calls for the level of the individuals. If our values and contribution are appropriate, the basics of sustainability will be kept and mankind will strive to create a more sustainable life form independently from the fact whether we live in a big city or in an ecovillage.

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THE FEATURES OF THE MACRO LEVEL ABSOLUTE CONCENTRATION OF HUNGARIAN INDUSTRY

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ABSTRACT
The re-appreciation of industrial concentration in the European Union and also in Hungary resulted in this issue becoming the focus of my research. In my opinion the industry-related concentration studies and analyses are important since the regional and sector structure changes in industry might induce a number of positive economic processes (increasing efficiency, competitiveness, deepening cooperation), may help considerably the rise of the given area and the whole national economy. Besides the number of positive effects, however, it can also result in some negative effects (e.g. one-sided industrial structure, a deep crisis during recession, industrially depressed areas), all of which may hinder the dynamic development of a region for a shorter or longer time. The present study aims to examine the characteristic changes of the domestic industry in recent years (spatial and structural) were characterized, and to what extent these changes influenced the geographical and sectoral concentration of our present industry.

Keywords: industrial concentration, employee, domestic sales, export sales

INTRODUCTION

During the past few years the geographical location issues of industry came to the forefront both in Hungary and in the European Union. On certain areas of our country different industry structures evolved and various industries became dominant in each region. The spatial location of certain industries was influenced by several social-economical factors (the historical traditions of production, ownership, available labour force and equipment, etc.) (TATAI, 1984; BARTKE, 1987). This was the reason why research again focused on the spatial location and structural change of industry, since Hungarian industry had undergone significant changes.

Our economic relations from one day to the next one became west oriented instead of having eastern orientation. This provided an opportunity that our country can be part of the global market and through that the part of the global economy (ABONYINÉ – KRAJKÓ, 1998; ABONYINÉ – KOMAREK, 2005). Consequently the market conditions, the production and distribution facilities changed, resulting in a completely new situation in the sectors of national economy, which meant new challenges in concentration, especially in the field of spatial concentration. In some sectors of the economy and industry sub-sectors the volume of production declined, the employment structure transformed, the production structure became irrational, the composition more heterogeneous and sometimes sales difficulties occurred. As a result of these changes the examinations in the territorial situation and the structure of industry started again (ANTAL, 1993; BARTA, 2002; BARTKE, 1993; NEMES NAGY, 1997; KISS, 2010; JENEY – SZABÓ, 2001; HORVÁTH, 2002; BODNÁR – HORVÁTH, 2005; BENKŐ-KISS – BODNÁR – KIS – HORVÁTH, 2010; ABONYINÉ – KOMAREK, 2011)

MATERIAL AND METHOD

There are several indexes to measure the territorial differences. Out of the various indexes the Herfindahl index is usually used to determine the spatial concentration of the industrial specialisation of the counties. In my opinion this index is the best for the present the spatial concentration as it exactly reflects the directions of the trends in the industrial sectors.

Concentration measuring:

Herfindahl index (absolute concentration):

$$H_j^S = \sum_i \left(S_{ij}^S\right)^2$$

where:
i = industry
j = county
S_{ij}^S = j county i industry share from j county total export trade

The Herfindahl index value can be between 0 and 1. The higher the value of the absolute concentration is, the higher the level of the absolute specialisation will be.
The data provided by the Central Statistics Office (KSH – Központi Statisztikai Hivatal) were the base for my work. (It would have been useful to examine a smaller unit area (e.g. a micro-region), but relevant statistics were not available.) I used these data to create indexes for making sectoral and spatial comparisons. Accordingly the data involved in the research were the number of employees in industry, domestic sales and export sales.
In case of industrial employees the data of the sites while in case of home and export sales the data of the industrial organisations with a county centre had to be considered. Based on the results I determined which industries had the largest and the lowest industrial concentrations.
The studied time interval is between 2000 and 2008. There were frequent changes in TEÁOR (Standard Classification System of Industrial Activities) numbers; therefore this is the period that allows the comparison and the analysis of data and drawing conclusions.

RESULTS AND CONCLUSIONS

Considering the concentration Hungarian industries by employees in 2000 the largest concentration values appeared in mining, wood and paper products, printing and chemical industry (Table 1).
Mining concentrated mostly in Veszprém County (18,0%) and Borsod-Abaúj-Zemplén County (24,2%). These two counties gave the 42.2% of all the employees of Hungarian mining. Within mining gravel, dolomite, lime stone, kaolin (Cornish stone), perlite and diatomaceous earth can be mentioned. Out of the mining enterprises the following ones must be mentioned: Ruda-Gipsz (Rudabánya), Zemplénkő (Sárospatak), Várhegy-Mészkő (Szalonna), Igrici-Kavics (Miskolc), Ediafilt (Erdőbénye), Perlit '92 (Pálháza), Colas-Északkő (Tarcal), MAL Bauxitbányászati Divízió (Ajka), Tapolcafői Karbonát (Döbrönte), Mangán Bányászat (Úrkút), Bakonyfer (Várpalota), and Basalt-Középkő (Uzsa).
28.8% of the employees in wood and paper production and printing activities concentrated in Budapest, while 23.7% employed in the field of chemical industry in Budapest, 11.6% in Borsod-Abaúj-Zemplén County. In the field of wood and paper production and printing activities the paper industry is outstanding (Dunapack, Budapesti Hullámkartongyár, Csepeli

Papírcsőgyár) and printing industry (Pátria Nyomda), while within the chemical industry it is the pharmaceutical industry (Egis, Richter Gedeon, Sanofi Aventis/Chinoin – Budapest) as well as the plastic production and procession (TVK – Tiszaújváros, Borsodchem – Kazincbarcika).

Table 1. The absolute concentration of Hungarian industrial sectors by employees in five years

Industrial sector	2000	2002	2004	2006	2008
Mining	0.13	0.10	0.09	0.08	0.08
Food, drink and tobacco production	0.06	0.06	0.07	0.07	0.07
Textile, leather goods and footwear production	0.06	0.06	0.06	0.07	0.07
Wood and paper products, printing activities	0.11	0.12	0.11	0.11	0.14
Chemical industry	0.10	0.11	0.11	0.11	0,10
Non-metal mineral products	0.08	0.07	0.07	0.08	0.08
Metallic raw material, metal processing products	0.08	0.08	0.08	0.08	0.08
Engineering	0.07	0.07	0.07	0.07	0.07
Other processing industries	0.07	0.07	0.07	0.08	0.10
Electric energy, gas, steam and water supply	0.07	0.07	0.07	0.07	0.06

Source: authors figures based on KSH data

The situation somewhat changed in 2008, when some industries became winners and some turned to be losers. In that year the highest geographical concentration was found in wood and paper production and printing activities, in chemical industry and other processing industry. The capital has the leading role, 31.6% of the employees are concentrated there. In that industry the rate of concentration increased by 2.8% point. In the field of chemical industry Borsod-Abaúj-Zemplén County must also be mentioned, by 9.8%. From 2000 to 2008 the concentration decreased in case of both counties. (In Budapest by 1.3% point, while in Borsod-Abaúj-Zemplén County by 1.8% point.) The higher index value of other processing industry can also be due to the capital. The concentration of the given industry increased from 15,1% to 24,8% in the period of 2000 to 2008. Other paper and cardboard production, other special machine production and other processing industry can also be mentioned here. The reason for this is that Budapest is the largest consumption centre, also exceeding in export and thus the spatial concentration of shipping activities is justified to some extent. The geographical concentration increased in case of food, drink and tobacco production, leather goods and footwear production as well as wood and paper production and printing, while it fell back in mining and electricity, gas, steam and water supply. Stagnation can be observed in chemical industry, non-metal mineral production, metal raw material and metal processing as well as in engineering. The lowest values can be seen in case of mining in the period between 2000 and 2008. All the same no significant geographical concentration was seen in employment in Hungarian industry during the examined period.

When examining the home sales data it can be observed that in the base year the highest geographical concentration appeared in chemical industry (64.9% - Budapest), wood, paper product and printing, (48.0% - Budapest) and metal raw materials, metal processing products (43.0% - Fejér County) (Table 2). In the capital within the chemical industry the medicine production (Egis, Richter Gedeon, Sanofi Aventis/Chinoin) and plastic products (Plannonplast, Dunaplast, Albuplast), while in case of a wood, paper product and printing paper industry (Dunapack, Budapesti Hullámkartongyár, Csepeli Papírcsőgyár) and printing (Pátria Nyomda) can be mentioned. In Fejér County in the field of metal raw materials and

metal processing products the Alcoa-Köfém Company in Székesfehérvár and ISD Dunaferr from Dunaújváros were outstanding.

The ranking of the absolute concentration of the industries changed in the subject year compared to the base year. In 2008 chemical industry (67.7%-Budapest) and paper product and printing paper industry (54.2% - Budapest) were improving their situation. In addition to these two industries the electricity, gas, steam and water supply (51.9% - Budapest) and mining (71.7% - Budapest and Zala County) came to the forefront, which means that four industries showed the highest geographical concentration. In the field of electricity, gas, steam and water supply ELMŰ, EFT Budapest, Budapesti Power Station, Főgáz, while considering mining MOL (Budapest), Rotary Fúrási Company (Nagykanizsa), and Dolomit (Alsópáhok) can be mentioned.

Table 2. The absolute concentration of Hungarian industrial sectors by domestic sales in five years

Industrial sector	2000	2002	2004	2006	2008
Mining	0,12	0,13	0,15	0,23	0,27
Food, drink and tobacco production	0,09	0,09	0,09	0,09	0,09
Textile, leather goods and footwear production	0,10	0,11	0,10	0,09	0,10
Wood and paper products, printing activities	0,25	0,26	0,24	0,26	0,31
Chemical industry	0,44	0,37	0,38	0,45	0,48
Non-metal mineral products	0,12	0,13	0,13	0,13	0,16
Metallic raw material, metal processing products	0,22	0,18	0,16	0,23	0,17
Engineering	0,14	0,13	0,11	0,13	0,12
Other processing industries	0,10	0,08	0,12	0,10	0,24
Electric energy, gas, steam and water supply	0,11	0,10	0,14	0,20	0,30

Source: authors figures based on KSH data

In the examined period the concentration of certain industries was rather hectic, mostly showing an increase in the tendency. Altogether there were two industries where minor fallback can be experienced (metal raw materials and metal processing products and engineering), and further two industries stagnated (food, drink and tobacco production, textile, leather and footwear production). All the other industries were characteristically increasing, with the highest development in mining, electricity, gas, steam, and water supply.

In case of export sales in 2000 and 2008 the highest geographical concentration is showed in electricity, gas, steam, and water supply, chemical industry and mining.

In 2000 the 98,9% of electricity, gas, steam, and water supply concentrated on the capitol, 70.7% of chemical industry on Budapest (47.0%) and Borsod-Abaúj-Zemplén County (23.7%), and 60,8% of mining on Zala County (37.2%) and Jász-Nagykun-Szolnok County (23.6%) (Table 3.). In the capitol in case of electricity, gas, steam, and water supply it is the electricity industry (EFT Budapest), in case of chemical industry the medicine production (EGIS, Richter Gedeon, Sanofi Aventis/Chinoin) and plastic priduction (Pannonplast), while in Borsod-Abaúj-Zemplén County it is the plastic production and processing industry (TVK – Tiszaújváros, Borsodchem – Kazincbarcika) that can be mentioned. In case of mining in Zala County it is thea Rotary Fúrási Company. (Nagykanizsa), while in Jász-Nagykun-Szolnok County it is the enterprises in pebble mining that are outstanding.

In 2008 98.4% of electricity, gas, steam, and water supply concentrated in the capitol (EFT Budapest), 69.7% of the chemical industry (EGIS, Richter Gedeon, Sanofi Aventis/Chinoin – Budapest, TVK – Tiszaújváros, Borsodchem – Kazincbarcika) is shared between Budapest

(46.7%) and Borsod-Abaúj-Zemplén County (23.0%) while 94.0% of mining concentrated in Budapest again (MOL).
In addition to these three industries metal raw material and metal processing products are also worth mentioning in 2008, which was most significant in Fejér County (47.6%). That was mainly due to ISD Dunaferrnek in Dunaújváros. There were changes in the absolute concentration of the industries in the examined period. There was a fallback in four industries (wood and paper production, printing, chemical industry, engineering, electricity, gas, steam and water supply) from 2000 to 2008, while in case of all the other industries an increase can be observed. Considering absolute concentration the most significant increase was in mining, while the greatest decrease occurred in engineering from 2000 to 2008.

Table 3. The absolute concentration of Hungarian industrial sectors by export sales in five years

Industrial sector	2000	2002	2004	2006	2008
Mining	0,23	0,24	0,16	0,55	0,88
Food, drink and tobacco production	0,09	0,10	0,14	0,17	0,16
Textile, leather goods and footwear production	0,10	0,12	0,16	0,15	0,13
Wood and paper products, printing activities	0,13	0,14	0,12	0,11	0,12
Chemical industry	0,29	0,26	0,27	0,31	0,28
Non-metal mineral products	0,13	0,12	0,12	0,12	0,19
Metallic raw material, metal processing products	0,16	0,15	0,21	0,26	0,25
Engineering	0,19	0,14	0,13	0,14	0,14
Other processing industries	0,10	0,11	0,11	0,16	0,19
Electric energy, gas, steam and water supply	0,98	0,90	0,68	0,35	0,97

Source: authors figures based on KSH data

The new large-scale (mostly) productive investments in Hungarian industry that has recently been completed, and also those that will be established in the future can create a new situation in the regional specialization and sectoral concentration of our industry (e.g. Hamburger Hungária – Dunaújváros, Mercedes-Benz – Kecskemét, Knorr-Bremse – Kecskemét, Audi Hungária Motor – Győr, Linamar Hungary – Orosháza, Csaba Metál – Békéscsaba and Szeghalom).
Therefore, the current industry structure changes and transformations have not been completed. Both the regional and the structural transformation of the industry keep going on, that is the reason why specialization and concentration calculations of the thesis were carried out and the conclusions refer to the time interval mentioned above.

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A PLANT BREEDING APPROACH TO ELIMINATE THE DEVELOPMENT OF CALCIUM DEFICIENCY SYMPTOMS IN SWEET PEPPER GROWING

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ABSTRACT
Plants show significant differences regarding the dynamics of the uptake and transport of the nutrients. The results of our experiments gave an explanation of the fact that the Ca^{2+} uptake and transport ability of pepper is different in each genotype. The Ca^{2+} requirement of the fruits of certain varieties is significantly higher than the amount the plant itself can take up. The determined selection and the further breeding work aimed to solve this anomaly and enable the safe growing of sweet pepper irrespectively of the $CaCO_3$ level of the soil. The basic goal of our breeding work was to improve the calcium utilization efficiency of the tomato-shaped sweet pepper variety 'PAZ' which is sensitive to calcium deficiency. Crossing with a suitable partner (Torkál F_1) resulted in a hybrid (Tokyo) the Ca^{2+} uptake, translocation and ecological adaptability of which proved to be far better compared to the free-pollinating variety. Regarding fruit quality, the hybrid did not leg behind the biological and consumers' values of the parental genotypes.

Keywords: Ca^{2+} deficiency, sweet pepper breeding, visual plant diagnosis

INTRODUCTION

In our days, sweet pepper is grown mainly in intensive vegetable production systems, in forcing facilities equipped with modern technology. Among vegetable crops, with its ca. 2000 hectares, intensive production of sweet pepper (*Capsicum annuum* L.) gives 50% of the domestic area of protected cultivation of vegetables. From this area, 150-175 thousand tons of yields are harvested each year. In Hungary, 10-12 kilograms of sweet pepper are consumed per person per year. The success of production, however, is influenced by several factors. Perturbations in nutrient supply of plants are not caused only by processes generated by nutrient deficiency of soil each case. In the formation of deficiency symptoms, inherited, endogenous characteristics of plants can also play an important role. According to MENGEL AND KIRKBY (2001), in the case of plants the nutrient uptake and utilization of which is under genetic control, the conscious selection and breeding can offer possibilities for the improvement of adaptability and yield. This idea is supported by RADEMACHER's (1937) thesis saying that such kind of varieties should be bred which successfully resist the nutrient supply disturbances occurring in the course of cultivation on the growing medium.
The deficiency symptom occurring the most frequently in the domestic pepper forcing is the so–called blossom-end rot caused by calcium deficiency. It can fully deteriorate marketing quality of the yield. Calcium occurs in plants as the salt of organic and inorganic acids, furthermore as an ion adsorbed to plasma colloids. Interacting with ß-indole acetic acid, Ca^{2+} ions have significant roles in cell elongation, furthermore in cell differentiation. Calcium is the main component of the middle lamella of the primary cell wall where it has a stabilizing role (BERGMANN, 1960; SZALAI, 1974). Abiotic stresses such as drought, heat-stress, especially in the root zone, have a significant effect in the development of calcium deficiency (TUBA ET AL., 2003). In tomato and pepper, the development of calcium deficiency is related to the transpiration rate. Low transpiration increases the number of calcium deficient fruits. Transpiration rate is also indicated by the temperature of the foliage surface (HELYES, 1990; HELYES AND VARGA, 1994). In the case of calcium deficiency, we have to make a distinction

between the real Ca^{2+} deficiency of the plants and the calcium viz. lime deficiency of the soil. According to SHEAR AND FAUST (1971), calcium deficiency can be detected in the yield even in cases when soil could cover the calcium demand of the plants. Blossom-end rot is an irreversible damage that does not recover even if calcium is immediately supplied. This is the consequence of the insufficient Ca^{2+} ion supply of the fruits (BUSSLER, 1963; WOJCIECHOWSKI ET AL., 1969; SOMOS, 1981). In domestic pepper production, the lime content of the soil must be in the range of 1-5% as determined by TERBE ET AL. (2005). LANTOS ET AL. (2010) observed that in protected cultivation, a significant difference can be found in the rate of calcium deficient fruits between growing in soil or in rockwool.

The basic goal of our selection work was to improve the calcium utilization efficiency of the tomato-shaped sweet pepper variety from Szentes, 'PAZ' which is sensitive to calcium deficiency. We have chosen a crossing partner which helped to achieve a reasonable yield even on so-called border soils which have a soil lime content diverging from the optimum of pepper cultivation.

MATERIALS AND METHODS

In our work, the 'Tokyo' hybrid was produced by the crossing of two varieties of different types. The mother was the tomato-shaped sweet pepper 'PAZ' from Szentes, which is a free-pollinating variety, while the pollinator parent was the California-type hybrid 'Torkál' F_1 (*Figure 1*).

Figure 1. The formation of blossom and fruits on the parents and on the hybrid

In the course of the cultivation tests, the extent of blossom-end rot symptoms occurring on the fruits due to Ca^{2+} deficiency was determined post-harvest via visual diagnosis. Productive characteristics studied in the 'Tokyo' hybrid and in the parental lines were as follows: fruit weight (g), 1000 grain weight (g), fruit-wall thickness (mm), length of the vegetation period (day) and susceptibility to fruit rot/gray mold *(Botrytis cinerea)*. To determine the traits, 4-4 fruits of biological maturity were collected from 12-12 plants each (*Tables 3-4*). Hybrid crossings were followed by cultivation tests performed on 6 sites of different soil lime content (*Tables 1-2*). Intensive ridge planting, foil-covered technology and the so-called Bulgarian method characteristic for the Szentes region were applied alike.

Table 1. Basic parameters of cultivation of the parents 'PAZ' and 'Torkál' F_1 in Nagymegyer and Szentes

Action	Site of selection	
	Nagymegyer	Szentes
sowing	28 March 2006	23. March 2006
pricking out	15 April 2006	22. April 2006.
planting out	10 May 2006	17. May 2006
spacing	85 + 40 x 40 cm	
population density	4 individuals/m^2	
pruning	bush form without pruning	

Table 2. Soil quality parameters of the test cultivation sites

Site	pH	Salt (m/m%)	Soil plasticity K_A	$CaCO_3$ (m/m%)	Humus (m/m%)	P_2O_5 (mg/kg)	K_2O (mg/kg)	NO_3-NO_2-N (mg/kg)
Nagymegyer	7.23	<0.02	36	5.0	0.58	1324	648	33.3
Szentes	7.60	<0.02	48	1.0	2.90	300	550	10.0
Ópusztaszer	6.98	<0,.02	60	2.32	2.34	287.6	313	65.4
Bánhegyes	7.60	<0.02	48	1.0	2.90	300	550	10.0
Mórahalom	7.40	<0.02	26	8.57	-	170	260	1.6
Japan	4.98	<0.02	60	0.5	5.70	514	763	31.4
Kyrgyzstan	7.93	<0.02	35	12.9	2.56	301	392	36.7

RESULTS

The summarized results show that during the whole growing period, symptoms of blossom-end rot never occurred on the fruits of the 'Tokyo' hybrid irrespectively of the site of production. Visual diagnosis of the fruits of the mother genotype 'PAZ' collected from six production sites showed that the occurrence of blossom-end rot was not typical in the period of the first and second harvests. In the later stages of growing, however, especially in the months June and August, symptoms of blossom-end rot could be detected on the fruits of 'PAZ' to various extents but on each growing sites (data not shown).

The frequency of blossom-end rot symptoms on 'PAZ' fruits showed significant difference (p = 0,1%) between the production sites of different soil lime content (*Tables 3-5*). As expected, the highest level of difference could be detected between the results of Japan showing the lowest and Kyrgyzstan showing the highest soil lime content (*Tables 2 and 5*).

Table 3. Averaged results of the crossing parents in Nagymegyer, at 5% soil lime content

	PAZ	Torkál F_1
blossom-end rot	above 10%	no
fruit weight	130 g	183 g
fruit-wall thickness	6.8 mm	10.8 mm
seed production	medium	excellent
susceptibility to fruit rot	susceptible	no
length of vegetation period	105 days	105 days

Table 4. Average results of the crossing parents in Szentes, at 1% soil lime content

	PAZ	Torkál F_1
blossom-end rot	above 10%	no
fruit weight	150 g	187 g
fruit-wall thickness	7.8 mm	11 mm
seed production	medium	excellent
susceptibility to fruit rot	susceptible	no
length of vegetation period	105 days	105 days

Table 5. Percentage values of the occurrence of blossom-end rot symptoms on 'PAZ' fruits depending on the $CaCO_3$ level of the production sites

Site	Blossom-end rot (%)		Significance levels		
	Mean	Standard deviation	Site	t- value	Significance level (p%)
Japan	68.75	12.9	Szentes	1.96	ns
			Bánhegyes	3.01	1
			Ópusztaszer	5.05	0.1
			Mórahalom	5.61	0.1
			Kyrgyzstan	7.30	0.1
Szentes	54.17	17.9	Bánhegyes	1.04	ns
			Ópusztaszer	2.53	5
			Mórahalom	3.65	0.1
			Kyrgyzstan	5.33	0.1
Bánhegyes	46.43	17.3	Ópusztaszer	2.04	5
			Mórahalom	2.61	5
			Kyrgyzstan	4.29	0.1
Ópusztaszer	31.25	11.3	Mórahalom	0.56	ns
			Kyrgyzstan	2.25	5
Mórahalom	27.80	12.9	Kyrgyzstan	1.68	ns
Kyrgyzstan	14.58	16.7			

Regarding fruit quality, the new hybrid did not leg behind the biological and consumers' values of the parental genotypes. Its vitamin C and carotene content was between those of the parents. Fructose content was close to equal in all of the three genotypes. Only the glucose content of the 'Tokyo' hybrid was slightly below the levels of the parents (*Table 6*). In the shaping of these features, besides breeding, the suitable ecological, light and nutrition supply conditions also had an important role, of course.

Table 6. Main quality values of the 'Tokyo' hybrid and those of the parental genotypes at the production site of Szentes

		Vitamin C (mg/100 g)	Carotene (g/100 g d.m.)	Carotene (g/100 g f.m.)	Fructose (mg/100 g d.m.)	Fructose (mg/100 g f.m.)	Glucose (mg/100 g d.m.)	Glucose (mg/100 g f.m.)
PAZ	mean	157.60	135.8	15.4	24.5	2.8	23.0	2.6
	st. deviation	8.65	56.08	5.43	0.55	0.41	1.68	0.06
Torkál F_1	mean	174.0	31.5	4.5	24.1	3.4	24.4	3.4
	st. deviation	26.58	12.38	2.35	1.16	0.64	0.82	0.57
Tokyo	mean	172.70	74.7	7.9	24.5	2.6	21.8	2.3
	st. deviation	20.81	22.18	2.33	1.21	0.17	1.68	0.22

d.m.: dry matter; f.m.: fresh matter

CONCLUSIONS

On the basis of our work performed in the summer forcing period on border-soils of different $CaCO_3$ content it can be concluded that the Ca^{2+} uptake and translocation ability of pepper is a complex trait depending also on the genotype. It can be transmitted through crossing thus in the next generation plants of good calcium uptake and healthy fruit building ability can be selected. The Ca^{2+} uptake, translocation and ecological adaptability of the hybrid proved to be by far better in contrast to the free-pollinating variety. The free-pollinating variety responded more sensitively to the changes in the ecological, nutrient, water and meteorological conditions of the area. Thus its reaction regarding calcium uptake and transfer is also more expressed.

The selection and breeding work described here can help to put an end to the formation of blossom-end rot generated by calcium deficiency in pepper.

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THE EFFECT OF *CLAMYDOMONAS* AND *ASTEROCOCCUS* GREEN ALGAE SPECIES ON SOIL STATUS CONSERVATION IN SWEET PEPPER GROWING

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ABSTRACT
In Hungary the most important vegetables is the sweet pepper (*Capsicum annuum* L.). In today's agriculture the preservation of soil fertility is a very important factor. In plant cultivation we can use organic nutrients or fertilizers to supplement soil nutrients. In the summer period of 2012 in a sweet pepper (*Capsicum annuum* L.) growing experiment we used a complex Biofluid vermicompost and an organic nutrient composed of *Clamydomonas* and *Asterococcus* (Chlorophyta) green algae species. As control, we applied Poly-feed N:16; P_2O_5:9; K_2O:26 chemical fertilizer containing micronutrients for sweet peppers. At the end of the growing period we analysed the soil samples for humus status and other nitrogen-containing compounds of soil. The natural soil conditions can only be restored by eco-friendly materials, which increase the productivity of the soil, but do not threat the environment. They restore the original ecosystem, which has been steadily destroyed by industrial production.

Keywords: green algae species, *Capsicum annuum* L., organic nutrient, sweet pepper growing,

INTRODUCTION

In Hungary, the maintenance of soil fertility is regulated by strict laws. The law allows farmers to use both natural and chemical fertilizers. In order to supply natural nutrient sources more and more biologically active substances are used.

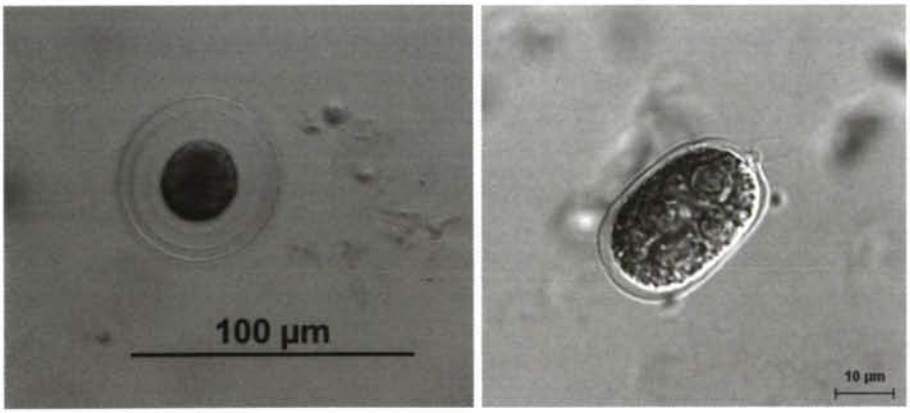

Figure 1. The cell structure of *Asterococcus* (left) and *Clamydomonas* (right) green algae species
(MELICHAR, 2011).

The micro-algae and cyanobacteria are beneficial organisms existing in soils. The algae are eukaryotic microorganisms capable of photosynthesis and they are able to have a positive impact on binding atmospheric nitrogen (MURRAY, 2004). They increase soil organic matter content, with their oxygen production reduce the damage of sulfides in soils likely to reduce sulfates. Their structure is made up of extracellular polysaccharides therefore greatly improve the soil structure (GUDIN & CHAUMONT, 1983; NAKAZAWA ET AL., 2004). The term soil algae

is a generic term, which includes obligate, facultative algae living in the soil and cryophyte algae living on the surface of snow and ice (ETTL & GÄRTNER, 1995). Based on the results of several years of research (FEHÉR, 1936; TRAINOR & MCLEAN, 1964; HUBER, 1985; DAVEY & ROTHERY, 1992) it is found that the activities of soil algae are mostly influenced by the light, moisture, temperature, soil pH, and the soil nutrients (LEPOSSA, 2003).

MATERIAL AND METHOD

Our research was carried out at the Institute of Szentesi Mag Ltd. in Szentes, situated on the South Plain in the growing period (from May - to August) of 2012. The Antal F_1 Hungarian sweet pepper hybrid was grown in a 25 m long, 9 m wide plastic covered greenhouse. In the growing period we provided 80-90% relative humidity and a temperature of 26-30 °C in daytime and 18 °C at night. The plastic-cover greenhouse was divided into two equal sections. In the first section, following the phenological stages of plants, micro-algae composition comprising elements was used for the nutrient supply of sweet peppers in 4 different periods (*Table 1*). Biofluid vermicompost microbial plant conditioner concentrate was used in appropriate dilution as macronutrient supplement at the same time when the algae was given. In the second section Poly-feed 16-9-26 microelement containing complex fertilizer was delivered to the plants. The nutrient supply of sweet peppers was periodically repeated from planting to the end of the growing season. Our research was based on the analysis of the starting soil status and on soil samples taken at the end of the growing with special regard to the preservation of the original humus content and other nitrogen-containing compounds (*Table 2*).

Table 1. The application of green algae and Biofluid fertilizers in sweet pepper growing

Time of treatments	Dilutions (%)	Methods of treatment
soil preparation	3-5	drop irrigation
planting	3	drop irrigation
before blooming	5	drop irrigation and leaf spray
fruit ripening	5	drop irrigation and leaf spray

The materials of nutrient supply:

- Poly-feed 16-9-26 chemical fertilizer: N: 16%; P_2O_5: 9%; K_2O: 26%. Microelements: MgO: 2,5%; SO_3: 25%; B: 0,01%; Cu: 0.01%; Fe: 0.1%; Mn: 0,1%; Mo: 0,004%; Zn: 0,025%.
- Green algae natural fertilizer: pH 6-7; N: 0.25%; P_2O_5: 0.1%; K_2O: 14%, Ca: 0,5%; MgO: 9000 mg/kg, B: 0,01%; Cu: 0,01%; Fe: 0,1%; Mn: 0,1%; Mo: 0,001%; Zn: 0,01.
- Biofluid vermicompost plant conditioner: pH 6-7; N: 2,5%; P_2O_5: 2%; K_2O: 2%.

RESULTS

Based on the results at the end of the growing season, it was found that after harvesting an average of 7,8 kg/m^2 sweet pepper yield, the humus fraction of the area treated with fertilizer significantly degraded, however the humus concentration value of the ones treated with green algae improved. *Table 2* shows that the level of other nitrogen-containing compounds of the soil showed better results when treated with *Clamydomonas* and *Asterococcus* green algae species than then the one treated with fertilizer. It was the result of the nitrogen-absorbing capability of the soil algae. The pH level of the soil treated with green algae did not change; it was on the value optimal for sweet pepper growing. However, the pH shifted to a 7.6 basic

direction, which may inhibit the uptake of anions and risk the nitrogen absorptivity of any soil microorganism (*Table 3*). In both cases, the K_2O concentration of the soil decreased to a value, which can not ensure to successful growing of sweet pepper. Therefore, at the autumn soil preparation an increased potassium incorporation of manure is required.

Table 2. The results of greenhouse soil samples

SZENTES	pH	Salt content (m/m%)	$CaCO_3$ (m/m%)	Humus (m/m%)	P_2O_5 (mg/kg)	K_2O (mg/kg)	NO_3-NO_2-N (mg/kg)
initial soil condition	6,7	<0,02	5,89	5,86	7404	2182	6,27
chemical fertilizer	7,6	<0,02	1,0	2,9	3000	550	10
natural fertilizers	6,8	<0,02	4,9	6,05	5317	382	23,53

(Laboratory of DABIC Kht. Szentes, 2012)

Table 3. pH value of nitrogen absorptivity of soil micro-organisms

Soil microorganism	Optimal soil pH value
Rhizobium sp.	6,0 - 7,0
Azomonas agilis	6,5 - 7,5
Beijerinckia derxii	4,5 - 6,0
Actinomyces cellulosae	6,0 - 7,0

(WWW. TANKONYTAR.HU, 2012)

There was no significant difference between the crop yield of the two treated sections. From both sections 5544 kg pepper bells were harvested, respectively. It was an excellent average of 7,8 kg/m^2 crop yield, out of which 60% was first class, 30% second class and 10% under class quality pepper. Our experiment justified that the effect of *Clamydomonas* and *Asterococcus* green algae supplement and vermicompost microbial plant conditioner was not worse than that of the chemical fertilizers.

CONCLUSIONS

The experimental results of 2012 year have clearly demonstrated that the green algae treatment in the intensive sweet pepper growing for preservation of soil status, the addition of Biofluid use is advisable. However, several years of production experience is required to analyze the effectiveness. Ours major experience: "The natural soil conditions can only be restored by eco-friendly materials, which increase the productivity of the soil, but do not threat the environment. They restore the original ecosystem, which has been steadily destroyed by industrial production (J. NEYER)".

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THE MAIN CHEMICAL COMPOSITION PARAMETERS OF PORK (review)

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ABSTRACT
The main aim of the study was to gather information on the chemical composition of the meat of pig, the pork. Data of several authors were summarized. The data of protein, the total fat, the SFA, MUFA and PUFA content were collected and also those minerals which have great importance on human alimentation. The level of total protein content of pig meat seems very stabile (19-24%) and hardly depend on the genetical background and the environment of the animals. The total fat content was between 1-15%. The results in fatty acid composition showed the following: among the saturated fatty acids the palmitic acid had the highest rate (21-25%) and the ratio of eicosanoic acid was less than 1%. Among monounsaturated fatty acids the palmitoleic acid level was remarkable high. The rate of linolic acid was outstanding in polyunsaturated fatty acids. Among the studied elements (Ca, P, Mg, Fe, I, Se, Mn, Cu, Zn) the iron can have a special role, because it is an important trait of the iron in the meat, that greater amount of it (15-35%) is utilized during the absorption, while only 1-5% of the iron content of the foods is made up of plants.

Keywords: chemical composition, pork, meat, protein, fat, minerals

INTRODUCTION

In Hungary, the annual, per capita domestic meat consumption significantly decreased in the last decade. The EU-27 consumption in average was 37 kg/capita/year (ANONYM, 2012). According to the data of the FAO, the meat consumption of Hungarian people was 74.7 kg per capita, per year. A notable domination was reported by POLGÁR's essay published in 2007. At that time, the per capita meat consumption was 63 kg, the other types of meat (sheep, goat, fish, rabbit, venison) were only 1.1 kg. The consumers of the developed countries pay more attention to the preservation of their health, gather more information about the healthy lifestyle, and they are consciously search for the foods, they presume healthy (ENSER, 2001; INCZE et al., 1998).

The nutrients of meat are indispensable for our vital functions, they are very important protein, fat, vitamin and mineral sources and thereby they are rich in flavouring materials (RODLER, 2009). The composition and the quality of meat are greatly influenced by breeding conditions (ALONSO et al., 2010). The meat quality of domestic animals, which were bred in natural conditions, is higher, and it means greater food safety for the consumer. The fat content of the meat changes on a wide scale (1-45 g/100 g), it depends on the breed, the feed, the age, the sex and the condition of the animal. The consumer behaviour is greatly influenced by these attributions.

In the recent paper, data from different authors were compared about the chemical composition of commercial pork.

DISCUSSION

Protein content

On the basis of the comparison of the data of the meat-examination in different sources, we can claim that there is no difference between the protein content of the meat (*Table 1.*).

ŠEGULA et al. (2007) examined the meat quality of the free-kept Large white, Landrace and Pietrain pigs. The animals ate only the vegetation of the pasture, and pumpkin at the end of the breeding period. KLIMIENÉ et al. (2010) got similar data, who examined the meat of cross-bred offspring (Lithuanian large white X wild boar). There was no significant difference in the protein and fat content between the results of the large white and the F1 generation. In respect of the protein content higher, in respect of the fat content lower values were measured in their samples. Japanese researchers (NISHIMORI et al., 2002) published similar results about the examination of the meat of cross-bred animals (domestic pig X wild boar). MARSICO et al. (2004) carried out feeding experiments on domestic pigs and wild boars, in which they verified that the fed fodder does not influence the chemical features of the meat. The meat of the wild boar always contained more protein and less fat, than the meat of the domestic pig. REN GUANG-ZHI et al. (2008) made the examination of the meat of five domestic pig breeds, of which we publish the results of the Duroc species. LOPEZ-BOTE (1998) analysed the fat content of the meat of the free-kept Iberian pigs. The fodders of the animals were acorn and the grass of the pasture. PEREZ SERRANO (2008) also made experiments with Iberian pigs and cross-bred animals (Iberian X Duroc). The result of PEINADO et al. (2008) was 4.6% total fat content in the meat of Large white X Landrace pigs, and this value is fit to fat content of the meat of wild boars which consume feed only from natural resources. Very low fat content (2.24%) was found by JAKIČ DIMIČ at al. (2007) who examined Large white, German landrace, Belgian landrace and New Hampshire pigs fed with silage and protein (plant and animal protein sources). NILZÉN et al. (2001) analyzed the pork of Hampshire X Yorkshire and Hampshire X (Swedish landrace X Yorkshire) kept free range and in stable also. The protein content of these animals corresponds with the results of several authors (*Table 1.*). It seems that the protein content of pork is more and less stabile in pig and less dependent from different factors.

Table 1. Protein content of commercial pork

Protein %	Source
19.10±2.70	TÓTH ET AL. (2009)
22.44±1.15	JAKIC DIMIC ET AL. (2007)
22.31±0.85	REN GUANG-ZHI ET AL. (2008)
23.42±0.14	KLIMIENĖ - KLIMAS (2010)
21.00±0.15	NILZÉN ET AL. (2001)
24.20±0.60	ŠEGULA ET AL. (2007)
21.20±0.11	PEINADO ET AL. (2008)
20.10±0.34	PEREZ SERRANO (2008)

Fat content and fatty acid composition

The total fat content of the meats (*Table 2*) shows an interesting result. The fat content in the meat of free range pigs was 2.1% and in stable was 2.4% (NILZÉN ET AL., 2001) lower than the research results of TÓTH et al. (2009) about the meat of Mangalitza pigs from organic production. LUGASI et al. (2006) examined the fat content of the meat of the Mangalitza, and the Large white X Dutch landrace. In case of Mangalitza 10.3%, in case of the cross-bred

animals 5% was the result. The total fat content of pork shows great variability (1-15%) depending on several factors. The fatty acid composition and levels are demonstrated in *Table 3*. The myristic acid (C14:0) and palmitic acid (C16:0) did not showed difference as it was found by different authors in domestic pig. Among the monounsaturated fatty acids the palmitoleic acid (C16:1) and the oleic acid (C18:1) showed bigger difference by the examined studies.

Table 2. Fat content of commercial pork

Fat %	Source
15.07±3.47	TÓTH ET AL. (2009)
2.24±2.73	JAKIC DIMIC ET AL. (2007)
3.16±0.36	REN GUANG-ZHI ET AL. (2008)
1.75±0.07	KLIMIENĖ - KLIMAS (2010)
1.77±0.05	WOOD ET AL. (2007)
2.10±0.13	NILZÉN ET AL. (2001)
10.00–13.00	LOPEZ-BOTE (1998)
1.00±0.37	ŠEGULA ET AL. (2007)
4.6±0.20	PEINADO ET AL. (2008)
10.3±3.8	LUGASI ET AL. (2006)

The fatty acid composition was analysed in different feeding circumstances in different domestic pig populations: Duroc (PEREZ SERRANO, 2008), Slovenian landrace and Slovenian large white (FURMAN ET AL., 2007), Landrace X Large white X Duroc crossbred (MITCHAOTHAI ET AL., 2007), and in all of them the level of palmitoleic acid was high.
ZUMBO et al. (2007) studied the level of linolic acid in a local breed (Nero Siciliano) and found lower level (4.72%) in the group was fed with acorn than in the group which was fed with barley (7.10%). The highest linolenic acid (C18:3 n-3) value was found in the data of MITCHAOTHAI ET AL. (2007).

Level of some important elements

The Ca levels of pork in publications are demonstrated in Table 4, and the alteration of the result is notable. Maybe the reasons of the differences are: the soil quality of the habitats, and the Ca and P content of the concentrates. The iron, the zinc, the copper, the manganese and the selenium are important minerals of the assorted flesh. It is an important trait of the iron in the meat, that greater amount of it (15-35%) is utilized during the absorption, while only 1-5% of the iron content of the foods is made up of plants (RODLER, 2004). The mezo- and microelements play a significant role in the metabolism processes of the body. The iron content was described low level in pork (TÓTH ET AL., 2009; MAIORANO ET AL., 2005; GERBER ET AL., 2008). The utilization of iron is correlated to the copper level. The Ca has also an influence on Cu utilization, so the high Ca level reduces the copper level of the meat. Data about the zinc content of pork shows relatively low values. The selenium content of the meat in the two groups remarkably differed.

Table 3. Saturated and unsaturated fatty acid content of commercial pork
(percentage of the total fatty acid content)

Fatty acid	Value (%)	Source
Myristic acid C14:0	1.53±0.05	FURMAN ET AL. (2007)
	1.22±0.17	MITCHAOTHAI ET AL. (2007)
	1.53±0.28	UEMOTO ET AL. (2011)
Palmitic acid C16:0	24.00±0.15	PEREZ SERRANO (2008)
	25.14±0.37	FURMAN ET AL. (2007)
	21.74±2.82	MITCHAOTHAI ET AL. (2007)
	24.60±1.10	LUGASI ET AL. (2006)
	23.86±0.32	GIULIOTTI ET AL. (2007)
	26.56±1.50	UEMOTO ET AL. (2011)
Stearic acid C18:0	13.00±0.29	PEREZ SERRANO (2008)
	14.01±0.57	FURMAN ET AL. (2007)
	14.73±2.52	MITCHAOTHAI ET AL. (2007)
	9.20±1.0	LUGASI ET AL. (2006)
	12.30±0.41	PEREZ SERRANO (2008)
	13.46±1.41	UEMOTO ET AL. (2011)
Eicosanoic acid C20:0	0.23±0.04	MITCHAOTHAI ET AL. (2007)
	0.06±0.01	GIULIOTTI ET AL. (2007)
Palmitoleic acid C16:1	2.50±0.16	FURMAN ET AL. (2007)
	0.91±0.22	MITCHAOTHAI ET AL. (2007)
	4.48±0.87	UEMOTO ET AL. (2011)
Oleic acid C18:1	48.20±0.27	PEREZ SERRANO (2008)
	39.80±0.53	FURMAN ET AL. (2007)
	30.39±1.44	MITCHAOTHAI ET AL. (2007)
	51.30±1.9	LUGASI ET AL. (2006)
	47.58±0.43	GIULIOTTI ET AL. (2007)
	48.38±2.16	UEMOTO ET AL. (2011)
Linolic acid C18:2 (n-6)	8.10±0.18	PEREZ SERRANO (2008)
	12.47±0.57	FURMAN ET AL. (2007)
	25.26±5.27	MITCHAOTHAI ET AL. (2007)
	6.20±2.00	LUGASI ET AL. (2006)
	4.72±0.02	ZUMBO ET AL. (2007)
	10.58±0.32	GIULIOTTI ET AL. (2007)
	5.48±1.25	UEMOTO ET AL. (2011)
Linolenic acid C18:3 (n-3)	0.79±0.10	FURMAN ET AL. (2007)
	1.00±0.23	MITCHAOTHAI ET AL. (2007)
	0.40±0.20	LUGASI ET AL. (2006)
	0.78±0.04	GIULIOTTI ET AL. (2007)
	0.23±0.05	ZUMBO ET AL. (2007)
Arachidonic acid C20:4 (n-6)	0.58±0.03	FURMAN ET AL. (2007)
	0.60±0.20	LUGASI ET AL. (2006)
	0.26±0.05	MITCHAOTHAI ET AL. (2007)
	0.05±0.008	GIULIOTTI ET AL. (2007)
	0.87±0.02	ZUMBO ET AL. (2007)

Table 4. Element content of commercial pork

Trait	Value	Source
Ca (mg/kg)	57.80±2.45	TÓTH ET AL. (2009)
	110.0±0.31	REN GUANG-ZHI ET AL. (2008)
	63.30±0.52	ŠEGULA ET AL. (2007)
P (mg/kg)	1754.00±23.3	TÓTH ET AL. (2009)
	2216.70±28.8	ŠEGULA ET AL. (2007)
Mg (mg/kg)	212.00±3.65	TÓTH ET AL. (2009)
	278.30±0.98	ŠEGULA ET AL. (2007)
Fe (mg/kg)	12.90±0.20	TÓTH ET AL. (2009)
	50.1±0.88	REN GUANG-ZHI ET AL. (2008)
	12.00±0.3	MAIORANO ET AL. (2005)
	30.21±10.51	JI-HUN JUNG ET AL. (1999)
	54.0	BUNCH ET AL. (1963)
	13.00±0.6	GERBER ET AL. (2008)
	64.00±7.80	ŠEGULA ET AL. (2007)
I (mg/kg)	0.025 ± 0.0155	HERZIG ET AL. (2005)
Se (mg/kg)	0.014	MAHAN ET AL. (1975)
	0.16±0.05	GERBER ET AL. (2008)
Mn (mg/kg)	0.504 ±0.01	REN GUANG-ZHI ET AL. (2008)
	0.43	LEIBHOLZ ET AL. (1962)
	0.12±0.06	GERBER ET AL. (2008)
Cu (mg/kg)	1.003±13.9	TÓTH ET AL. (2009)
	1.91±0.45	REN GUANG-ZHI ET AL. (2008)
	1.08±0.23	JI-HUN JUNG ET AL. (1999)
	2.1	KLINE ET AL. (1971)
	0.92±0.36	GERBER ET AL. (2008)
	1.00±0.20	ŠEGULA ET AL. (2007)
Zn (mg/kg)	20.30±0.15	TÓTH ET AL. (2009)
	4.94±0.91	REN GUANG-ZHI ET AL. (2008)
	19.49±6.02	JI-HUN JUNG ET AL. (1999)
	15.3	COUSINS ET AL. (1973)
	3.30±0.30	GERBER ET AL. (2008)
	12.30±0.70	ŠEGULA ET AL. (2007)

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LIVE WEIGHT CHANGE EXAMINATIONS OF INDIGENOUS SPECKLED HENS ON A FARM IN HÓDMEZŐVÁSÁRHELY

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ABSTRACT
The aboriginal species are not compatible with the modern ones in general and cannot keep up with the industry-like economical production. For this reason we have to endeavour to preserve our old indigenous species and to keep their important characteristics that can be utilized for breeding later on. One of the criteria of the gene preservation of our aboriginal species is to keep in an unaltered form with minimal gene loss preserving their original variability. In the Pilot Farm of the University of Szeged Faculty of Agriculture we have been dealing with the genetic preservation of two breeds of the aboriginal speckled Hungarian hens – the Speckled Hungarian Hen and the Speckled Transylvanian Naked Neck Hen since 1977. We examined the quality parameters of the two species of speckled hens looking for answer to the questions whether it was possible to preserve the live weights after twenty generations, whether the original variability is preserved and whether we carried out successful gene preservation activity during the gene preservation work.

Keywords: Speckled Hungarian Hen, Speckled Transylvanian Naked Neck Hen, genetic variance, gene preservation, rare breeds

INTRODUCTION

Animal production has significantly increased during the last couple of decades. (WOELDERSE et al. 2006). From the fifties years of the twentieth century the poultry hybrids fully transformed the structure of species. Due to the emergence of hybrids, the number of hen varieties, which play a role in the poultry-farming economy, greatly reduced. (SÓFALVY, 2002). BODÓ (1991 wrote in order to protect the genetic reserves: the evolution of various biotechnology techniques results displacement of more productive domestic breeds local varieties with less productivity throughout the world. The degradation of native (old traditional, local) varieties, their decline, and disappearance, -says BÖGRE and DOHY (1991)- is a drastic form of a process, when the total gene pool of a breed (genotype group) is wasted Original indigenous breeds are often replaced by globally used high productive breeds. The least popular breeds are often maintained only locally and in small populations. (WOELDERS ET. AL., 2006). The Food and Agriculture Organization of the United Nations has been mandated by its member nations to manage the global animal genetic resources, and major progress has been made.(BARKER, 1999) In Hungary there is an official programme for maintenance of domestic animal genetic resources which is supported financially by the government. (BODÓ, 1985). Conservation of local breeds (both plants and animals) through the development of different ecological types of production systems and products have real importance in maintaining agro-biodiversity and agro-ecosystems. (SZALAY - DONG XUAN, 2008). Preservation of genetic resources of domestic animals is a specific way to protect the gene reserve. (BODÓ, 2011) The in situ conservation of live populations requires no advanced technology. There are optimal sampling strategies and breeding strategies but the basic needs of an in situ programme are already available and affordable throghout the world. The farmers of every region and nation know how to manage and maintain their local strains. They already have the capability, all they require its direction. (HENSON, 1992).. The breeds thus conserved

will provide valuable resources for the future of agriculture, especially in the developing world. (HALL – BRADLEY, 1995)

MATERIAL AND METHODS

The native speckled hen stock was founded in our pilot farm in 1977. We are breeding two species: the Hungarian Speckled Hen (further: feathered neck) and Speckled Transylvanian Naked Neck Hen (further: naked neck). We maintain 4 lines from the feathered neck breed (21., 22., 24., 28. lines) and 1 line from the naked neck breed (26 line). For the preparation of our work we use of the production data of the Speckled Hungarian Hen and the Speckled Transylvanian Naked Neck Hen stock of the Pilot Farm that is kept as elite stock.

We carry out our breeding program as a continuation of Dr. Ferenc SÓFALVY's work both in case of the Speckled Hungarian Hen and the Speckled Transylvanian Naked Neck Hen.

Till 1998 the naked neck stock was not homozygote. At the hatching of the naked neck line feathered neck chicks hatched. Homozygote examination was carried out with regard to the naked neck hens as a result of which the feathered-collar necked heterozygote specimens were rejected. Since then we have used the cocks which were absolutely naked on their neck and crop part of the body. They were considered like homozygote in sense of naked neck. To prevent the deterioration of inbreeding in the case of the feathered neck stock we have been applying the cocks according to a rotating mating system on the certain lines since 2001. The hens of the line stay in their place and the cocks are changed every year in rotation. We carried out out-crossing in our naked neck stock with roosters brought from Gödöllő in 2004.The standard of values of the speckled hen was measured consequently in certain periods. The weight of the one year old hens in the stock was weighed every year till the age of 20 weeks at colonization. The weight of the penned hens was measured on 5 g punctuality Berkel scales. At the end of the examination we calculated the average, deviation and relative deviation.

We carried out the data procession, analysis and graphic representation with the help of Microsoft Office Excel 2003 program. SPSS for Windows 15.0 program was used for the analysis. The data were analyzed by the method of variance. The results obtained during the tests are presented in tables or in graphical form. On the graphs we illustrated the average values, the standard deviations and the coefficient of variation. The formal establishment of the graphics was carried out using Microsoft Photo Editor 3.0.2.3 and GIMP 2.6.11 editing program.

RESULTS

Examine the body weight of the one years old hens of the 21st -line at the time of the colonization (Figure 1.) we concluded that the body weight through the initial eleven generation said to be stable. Because of the result of crosses between the lines -which was started in 2001- the body weight was significantly ($P<5\%$) reduced until the second generation period. This lower body weight has been preserved through four generations. The stabilization selection regarding to the body weight was successful as the body weight remained within the standard deviation values and at the end of the test period and the body weight was similar with twenty generations before.

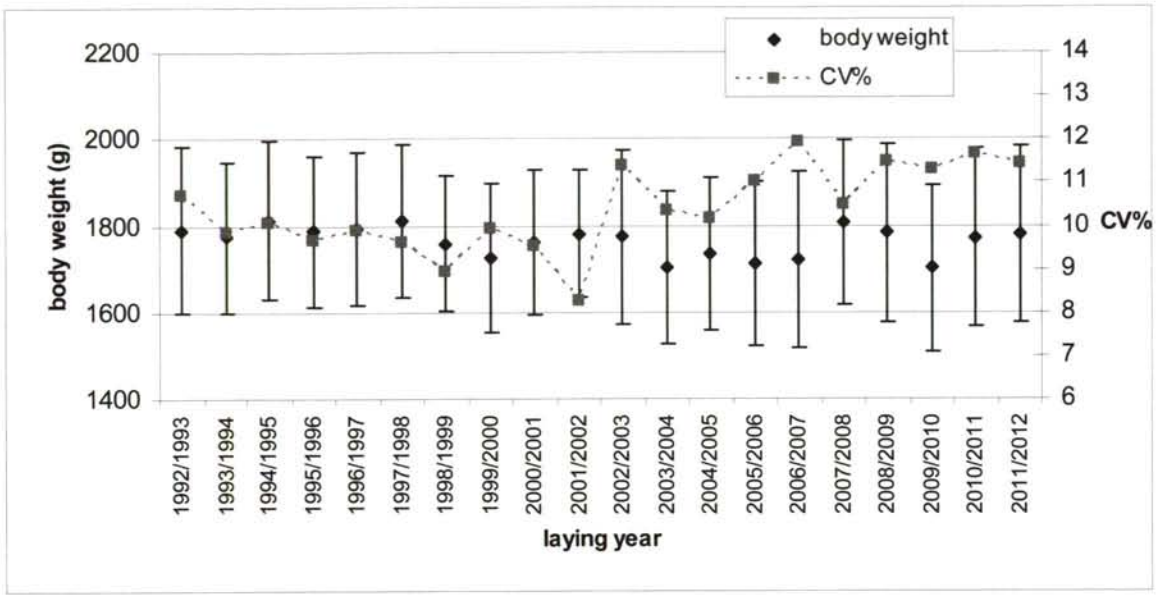

Figure 1. The body weights of one year old hens of 21st line at colonization

The initial downward trend of the standard deviation values were stopped by the rotation pairing with the cocks because the standard deviation values have increased significantly (P<5%) in 2002. Since then the deviation values of the 21st-line are similar to those of the initial period. From the beginning of the test the variance of the body weight at the colonization showed a downward trend. The variance has been increased to a moderate level by the breeding started in 2001.

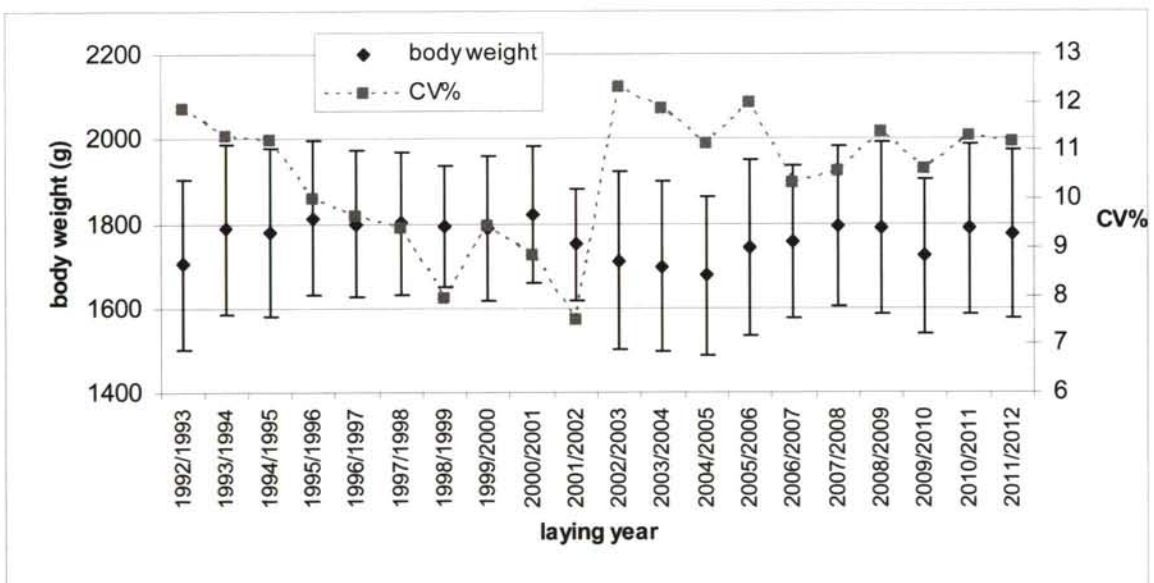

Figure 2. The body weights of one year old hens of 22nd line at colonization

Studying the live weights of the 22nd -line at the time of colonization (Figure 2.) we can say that the average body weight, comparing to the initial values, had increased during the second year of the study period, which was stabilized close to 1800 grams through eight generations. In the third generation after the crossing between the lines we can experience a significant

decrease (P<5%) with the pre-crossing values. Similarly to the previous line, the body weight of the recent period show almost the same values compared with the beginning of the test. The trend of the standard deviation of this line was influenced by the crosses between the lines. Similarly to the previous line the decreasing standard deviation values of the initial period have high value since the introducing of the breeding process till today. Examining the variance we can conclude that the decreasing low variance has been raised to a medium level by the crossing procedure. In case of the 22nd-line the race preservation proved suitable for the development of the weight and the values of the standard deviation because of the similar values measured at the end of the test than it was at the beginning of the test.

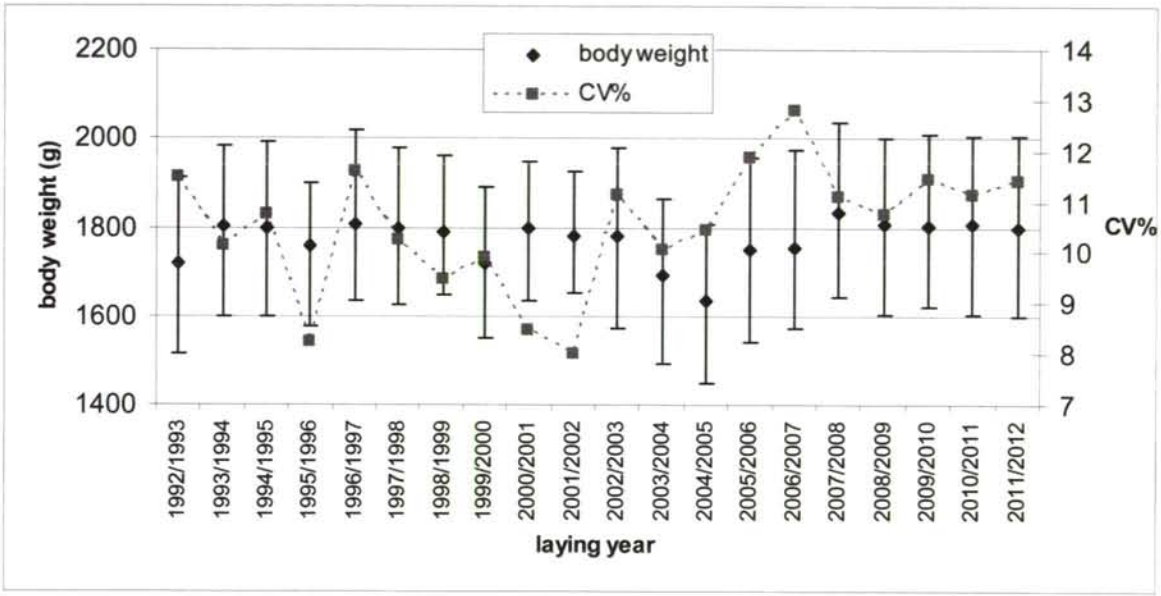

Figure 3. The body weights of one year old hens of 24th line at colonization

The body weight of the one-year old hens of the 24th-line at the time of colonization (Figure 3.) was stabilized from the initial value over 1700 grams to under 1800 grams by the early 2000s. After starting the crossing between the lines in the second generation a significant (P <5%) decrease can be observed in body weight, which increased in the fourth generation, and later on it was stabilized over the value of 1800 grams. The decreasing trend of the standard deviation values - similarly to the two previous lines – disappeared after the effects of the 2001 line-crossing. Since then, the stock has higher standard deviation values. The trend of the decreasing relative standard deviation also disappeared after the starting of the crossing procedure and since then it has been moving at a moderate level. The values of the body weight of the 24th-line were stabilized during the last four years and show similar values measured at the beginning of the test period, and therefore the stability of the selection at this code also proved successfully.

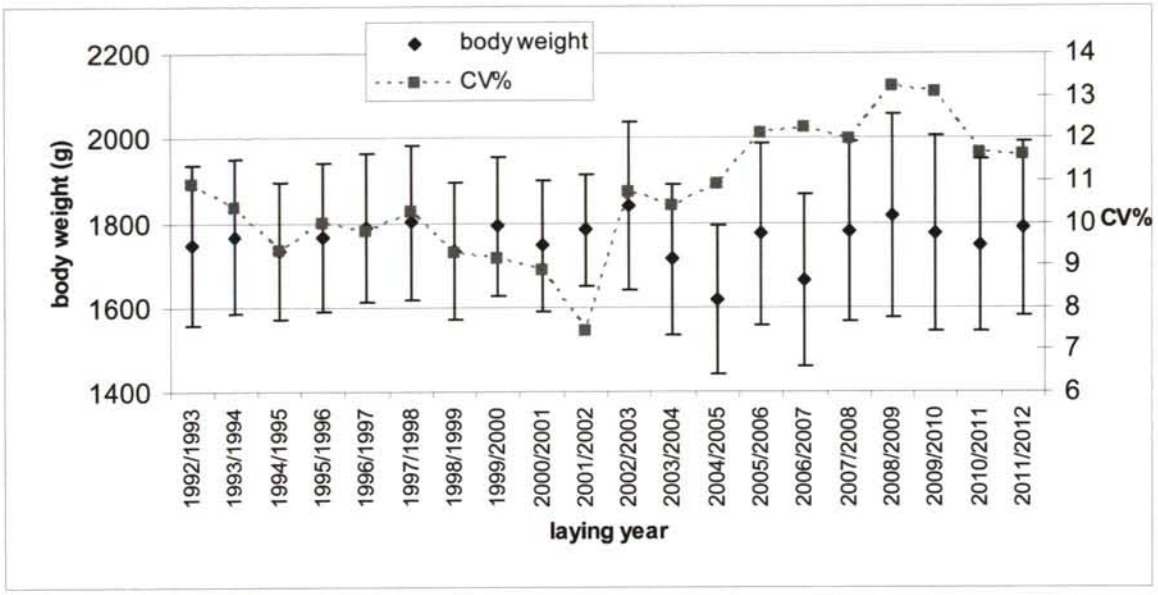

Figure 4. The body weights of one year old hens of 28th line at colonization

The trend of the body weight of the 28th-line is similar to the ones in the previous lines. The values of the body weight in the first half of the test period (Figure 4.) was close to 1800 grams. After starting the crossing process in the second generation we observed a significant ($P<5\%$) weight loss. The body weight of the subsequent generation decreased close to 1600 grams. We can observe significant ($P<5\%$) fluctuation among the values of weight of the subsequent third generation. The values of weight of the later three generation are similar to values measured during the initial time of the investigation, which proves the correctness of our breeding process.

The development of the standard deviation values was similar to the previous three lines. The downward trend of the initial values was stopped by the crossing programme introduced in 2001. Since then the 28th line has higher standard deviation than the initial values, which refers to the imperfection of the stabilizing selection. The initial medium variance during nine generations decreased to low level. (CV% below 8%), which increased to 10 % relative standard deviation value after introducing the crossing programme among the lines and currently it is still at a medium level.

The average weight of the nacked-necked breed signed with 26 number dropped to below-1600 grams through five generations (Figure 5.), which is significantly less ($P<5\%$) than the initial value. The hatching of the 1998th year was already carried out by using eggs coming from breeding with homozygous naked-necked cocks. At the colonization carried out in 1998 regarding to the body weights there was significant ($P<5\%$) growth compared to the previous year.

By the introduction of out-crossing with cocks from Gödöllő carried out in 2004 year significantly ($P<5\%$) lower weighed stock was colonized in the following year. After the growing trend of the body weight of the stock, the weight of the one year old naked- neck hens were stabilized. In 1998 the standard deviation values decreased at the beginning of the breeding by homozygous cocks. Probably because of the strong selection effects, then they increased and showed higher values compared to the previous period after the introduction of blood-freshing.

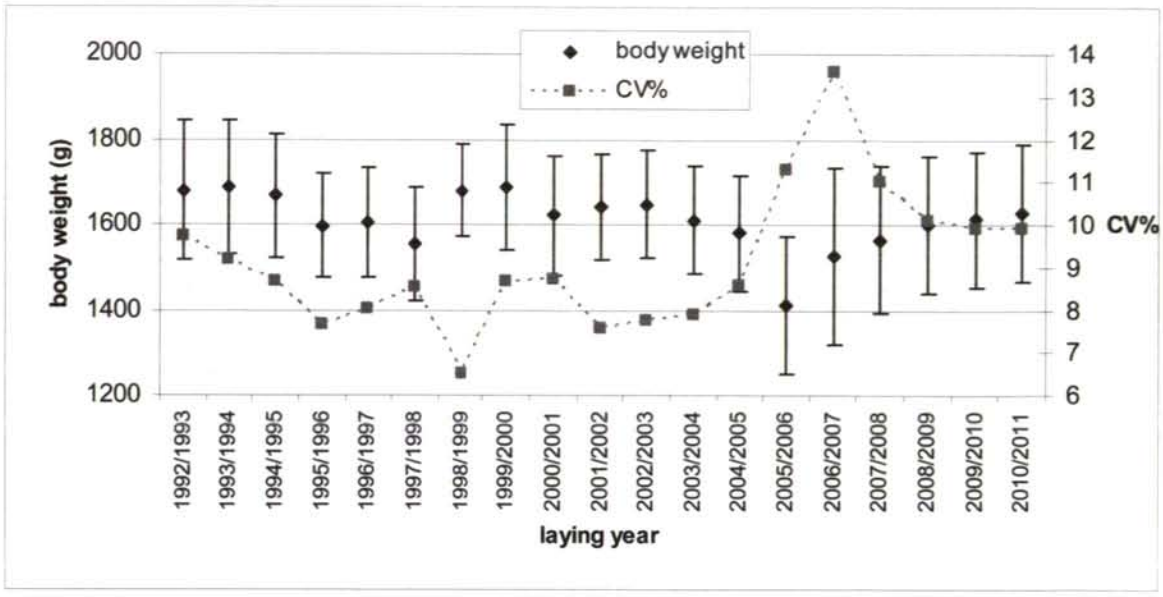

Figure 5. The body weights of one year old hens of 26th line at colonization

Less than 10% level of the relative standard deviation values were raised above 10 % by the blood-freshing, which has been stabilized around 10 % with decreasing tendency.
The failure of our race preserving breeding at the 26th line can be blamed for the fact that the value of the average body weight is below the initial ones; but the standard deviation are greater than their baseline values.
The weight of the naked necked stock showed significantly (P<5%) lower values compared to the lines with feathered necks. Significant differences can be found among the body weight of some lines with feathered necks in particular years of the test period, but unequivocal conclusions can be drawn only from the different body weights at the colonization in the year of 2002. There were no significant (P<5%) differences, between the body weights of the 21st and 24nd lines in this year. The body weights of the other lines were significantly (P<5%) different from each other.

CONCLUSIONS

The breeding process between lines applied in the feathered neck stock at present is suitable for maintaining the variability of live weight on a medium level. There was a significant decrease of the average body weight of the naked neck stock in comparison with body weight of 20 years before. Considering this, the breed maintenance breeding in case of the naked neck stock was not successful. With the species preservation selection applied in the stock of the Speckled Hungarian Hen it was possible to preserve the body weight value at colonization on a level near to the one recorded twenty years ago. In the perspective of these two plummets we can declare that our breeding programs are successful.

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THE BODY CONDITION SCORING SYSTEM OF DAIRY COWS (review)

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ABSTRACT
The body condition scoring system (BCS) is a means of accurately determining body condition of dairy cows, independent of body weight and farm size. The body condition scores represent a subjective visual or tactile (or both) evaluation of the amount of subcutaneous fat in a cow. The system is a useful method of evaluating body energy reserves and is used widely for evaluating nutritional status in dairy cows. Changes in BCS reflect both the body composition and energy balance, which in turn, are critical for metabolic stability, health and fertility. The objective of this study is to present the role of body condition scoring system in dairy management. The main focus is the impact of changing BCS on milk production, changing of body weight and reproduction. The advantage of the body condition scoring system of dairy cattle is that the grouping of stocks is easier with it and the deficiency of feeding and keeping system can be detected. The body condition scoring system is a little labour-intensive, but the application of the method will be returned in milk production. The use the method in the practice is worth considering based on economic and physiological criteria. The aim of this study is to present how useful the body condition score system for the farmers.

Keywords: body condition scoring system, milk production, energy reserve, nutritional management, reproduction management

INTRODUCTION

The Holstein-Friesian cow is the first among milking cows in the world nowadays. This type gives 97 percent of the controlled milking herd in our country. The Holstein-Friesian cattle are very sensitive to changes in their environment, which is particularly true for feeding. The cows have different needs compared to the feed consumed at the different stages of lactation. Care should be taken at the beginning of lactation, because it is difficult to satisfy the nutrition needs of the high production dairy cows, therefore the cows lose from their body reserves due to the high milk production. In most cases the excellently producing cows with ideal appearance get out of the production earlier than the others. The significant milk production yields are shown in the production parameters of the Hungarian stocks; in December 2010 the stock average ranked first place in Hungary was 33.38 kg (ATKFT, 2010).The breeders have to face many problems beyond the outstanding milk production. In recent decades the useful lifetime decreased, reproductive disorders and common metabolic disorders appeared, so infertility is common and, re-conception is delayed etc. (BERTA, 2010).It is because of these problems, among others, that Hungarian and international breeding management organisations have increased concern regarding the body strength and the useful lifetime of the animal in addition to milk production. The body condition scoring also has been part of the linear type classification in Hungary since 2007.The Hungarian (BRYDL, 1994; BÁDER ET AL., 2002; GERGÁCZ, 2009; TŐZSÉR ET AL., 1995) as well as the international (EDMONSON ET AL., 1989; HADY ET AL., 1994; RUEGG AND MILTON, 1995) literature refers to the advantages of the body condition scoring system. Using the body condition system in our country has been mainly adopted for meat type herds. This method is not widespread in farm practice, which is particularly true for dairy farms.

DISCUSSION

Relationship between BCS and daily milk yield

In practice, the grouping of cows in nutritional groups is based on milk production, reproductive cycle and body condition scoring. The cows are usually grouped monthly, after milk recording. The results of the relationship examination between body condition and milk production (DOMECQ ET AL., 1997; DILLON ET AL., 2003; WATHES ET AL., 2007) are different. A number of studies did not confirm relationship between body condition and milk production (MARKUSFELD ET AL., 1997; HEUER ET AL., 1999; BERRY ET AL., 2002). KADARMIDEEN (2004) found a negative (range, –0.50 to –0.39) genetic correlations of BCS with milk, fat and protein yield. Several authors (WALTNER ET AL., 1993; RUEGG AND MILTON, 1995; BEWLEY AND SCHUTZ, 2008) refer to the research by FROOD AND CROXTON (1978). Their publications confirmed that the cows lean at calving (with BCS <2) produced below their potential milk yield whereas those calving with BCS above 2.5 produced according to their expected potential milk yield. According to DOMECQ ET AL. (1997) an increase in BCS during the dry period resulted in an increase in milk yield and the milk -yield –acceleration after calving. Body condition score at calving and nadir as well as loss of body condition score between calving and nadir has significant effects on milk production, which also reflects in body weight change. (ROCHE ET AL., 2007). According to the study of PEDRON ET AL. (1993) and RYAN ET AL (2003) the cows with the higher BCS at calving had a higher milk yield in early lactation than those with the lower BCS. SAMARÜTEL ET AL. (2006) divided the cows into three groups based on their BCS at calving (thin: BCS <3.0; moderate= BCS 3.25-3.5 and fat: BCS >3.75). In they study it was found that the fat cow group had higher fat corrected milk (FCM) production during the 305-day lactation period. According to HORN (1961) the BCS at calving affects the fat and protein content of milk. Cows calving in better body condition produce milk with more fat content that cows calving in poorer BCS. MARKUSFELD ET AL. (1997) report that the effect of BCS at calving on milk fat content is most pronounced in the first 90 days of lactation. BERRY ET AL. (2007) observed that cows that lost more condition in early lactation produced more milk of greater fat and protein concentration. This process has not been confirmed when cows lost more than 1.5 to 1.75 BCS units. According to HOLTER ET AL. (1990) the milk fat concentration of cows underconditioned at calving will be lower, but the poor condition does not have any effect on the milk yield. The BSC and the changes in BCS during the dry period also affect milk yield. CONTRERAS ET AL. (2004) estimated the BCS at the end of the dry period, and they found that the cows with BCS ≤3.0 produce more milk than cows with BCS ≥3.5 during early lactation. GYÖRKÖS ET AL.(2002) examined the pre-calving BCS for first lactation heifers. Based on their hypothesis the effect of an undesirably excessive fat condition (BCS 4.1-5.0) causes lower milk yield in the first lactation, and further decreasing can be observed in the second lactation. STOCKDALE (2005) also observed in his experiment that the milk production was better and the milk fat content was higher in case of the cows with higher BCS at calving. The increased body fat reserves mobilisation in the lactation results in decreasing BCS, which is typically accompanied by high milk production (ROESCH ET AL., 2005; BINES, 1976; Hart ET AL., 1979). It is generally observed that the cows with high milk yield have a greater BCS loss during the lactation than the lower producers (GALLO ET AL., 1996; CUTULLIC ET AL., 2009). This process may be related to the fact that there are differences in energy intake and milk production during the lactation.

Relationship between body condition and reproduction

The reproduction of dairy cattle is a very complex trait. There is negative relationship between the increasing milk production and reproduction (BUTLER, 2000; HUSZENICZA ET

AL., 2003; PRYCE ET AL., 2004; GUTIERREZ ET AL., 2006). At the beginning of lactation, the milk production has a definite priority over the reproduction (FERGUSON, 2001). The declining fertility results have been verified during recent decades. BUTLER (1998) reported in his study that in the U.S.A. the proportion of cows pregnant in the first insemination was 65% in 1951 while it was only 40%.in 1996. In the UK ROYAL ET AL. (2000) analysed the changes of this very same parameter between 1975-1982 and 1995-1998, and found that the pregnancy rate to first service declined from 55.6% to 39.7%. The antagonism between the improving milk production and deteriorating reproduction may be partially explained by the changes in the genetic bases. The cumulative incidence of reproductive and other disorders as consequences of insufficient nutrition (especially lack of energy) due to the increased milk production is more important. According to LUCY (2001) the declining fertility is probably a combination of a variety of physiological and management factors that have an additive effect. The management, feeding, milk production and genetics are the main reasons of the declining reproduction parameters in modern dairy cattle (CHAGAS ET AL., 2007; TAMADON ET AL., 2011). The negative energy balance is a prominent risk factor for the low fertility (SAMARÜTEL ET AL., 2008). The extent and duration of the energy deficiency period after calving are associated with the low fertility after ovulation (KÁTAI ET AL., 2003; BUTLER, 2005). According to SZENCI (1999) the sooner the cows restore their EB, the sooner they will start cycling. The energy deficit is well controllable by the change of the condition. Body condition change from 50 to 80d after calving significantly affects the reproduction parameters. One unit or more loss of BCS (on a five-point scale) extend the dates of the first ovulation, the first recorded oestrus, and the first insemination. The proportion of pregnancy at first service is smaller and the fertility index is higher in these cows. HOEDEMAKER ET AL. (2009) showed that body condition loss in the dry period is related to the higher proportion of reproduction disorders. GILLUND ET AL. (2001) did not show correlation between reproduction and BCS at calving; however they claimed that the BCS change is a good indicator of fertility results. According to MEIKLE ET AL. (2004) the primiparous cows calving with a BCS < 3 have a late resumption of ovarian activity. SAMARÜTEL ET AL. (2006) also analyzed the relationship between the BCS at calving and the reproduction. In their work they analyzed the BCS of thin (BCS<3.0), medium (BCS=3.25-3.5) and fat (BCS>3.75) cows. The best results have been observed in the group of medium BCS. None of the fat cows became pregnant in the first insemination. In contrast, the first service conception rate were 17% and 23% for the groups with low and medium BCS, respectively. The interval from parturition to first insemination was the longest in case of the cows with low BCS. According to FEKETE (1993), cows that were over-conditioned at calving had several times more periparturient disorders than cows in thin condition. The loss of BCS in early lactation is unfavorably related to reproductive performance, particularly in high genetic merit animals than the change in BCS from wk 1 to wk 10 (PRYCE ET AL. ,2001). According to TAMADON ET AL. (2011) the level of BCS change after calving greatly affects the luteal activity in high-producing dairy cows. The loss of body condition between calving and first service should be restricted to below 0.5 BCS unit to avoid a detrimental effect on reproductive performance (BUCKLEY ET AL., 2003).

Relationship between body condition and live weight

The knowledge of the body weight of dairy cows is more important from several reasons (nutrition, culling, and heifers breeding).However, the measurement of body weight can cause extra work and an extreme moving of the stock. The professional processing of the weight data is not simple, efficiency is influenced by the significant differences between the weights of the cows within the stock. The body weight is affected by body size, skeletal development, and current nutritional status (gut fill), fatness, or thinness (ENEVOLDSEN AND KRISTENSEN, 1997). The results of the analyses between the BCS and BW are different, due to the

subjectivity of BCS and the variability of body weight. In their work ENEVOLDSEN AND KRISTENSEN (1997) examined the relationship between body condition and body weight in different breeds. The result in Danish Friesians breed was r = 0.53, in Danish Jersey (r = 0.34) and in Crossbred Jersey× Red Danish was 0.57. OTTO ET AL. (1991) analysed the relationship between the two parameters, in their calculation the r^2 value in U.S. Holstein-Friesian cows was 0.62. MEIKLE ET AL. (2004) studied the relationship between the two parameters by the number of lactation. A tight correlation was found between body weight and condition regardless of the lactation number (r = 0.76 in firs lactation and r = 0.74 in later lactation). In the study of TOSHNIWAL ET AL. (2008) the genetic correlation between the two parameters was r=0.6. In their opinion that the Body weight (as a complex trait) observations should be supplemented with BCS to estimate the body composition of daughters. The daily body weight measurement combined with BCS at specific lactation stages (such as calving and first insemination after calving) could provide accurate assessment of energy balance change during the lactation. The opposite result was observed in the work of SUTTER AND BEEVER, 2000 (in: HORAN ET AL.,2005). They concluded that body weight change is an inadequate index of body tissue mobilization in early lactation because the BW can be significantly increased by gut content and water consumption. One unit of change in BCS corresponds to some BW change (21-210 kg) (WRIGHT AND RUSSEL1984; CHILLIARD ET AL., 1991; OTTO ET AL., 1991; WALTNER ET AL., 1994; ENEVOLDSEN AND KRISTENSEN, 1997; KOMARAGIRI AND ERDMAN, 1997; KOMARAGIRI ET AL., 1998; JAURENA ET AL., 2005; BERRY ET AL., 2006). According to KOMARAGIRI AND ERDMAN, (1997) one unit of change in body condition score corresponds to about 40 kg of body fat loss. The body fat mobilization in the first two months of lactation is from 15 to 60 kg CHILLIARD ET AL. (1991). One unit change in body condition corresponds to 35 to 44 kg BW loss, this resulting in 21 to 29 kg mobilization of body fat. According to WALTNER ET AL. (1994) one unit change in BCS equate to either 35 kg of body fat or 5.3% of live BW change. In their work ENEVOLDSEN AND KRISTENSEN (1997) examined the relationship between BCS and BW, the result was 22 to 57 kg per unit of decrease in BCS. TRACHSEL ET AL. (2000) also observed a significant positive association between BW and BCS. However, the value was not constant to breed and season (depended on the breed and the season). Accordig to ROESCH ET AL. (2005) the lower live weight can result in lower milk production. HORAN ET AL. (2005) found that the lactation number (parity) is also affected by BCS and BW between the calving and nadir. In their study the second-parity cows had lower BW and BCS loss between calving and nadir (50.6 kg and 0.56 point) compared with the primiparous cows (63.5 kg and 0.63, point) and third-parity ones (57.8 kg and 0.69, point).

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THE FEED COMPOSITION OF ROE DEER (*CAPREOLUS CAPREOLUS*) ON PLAIN HABITATS

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ABSTRACT
In Europe and in our homeland the roe deer is the most widespread big game, estimated population in 2010 exceeded three hundred and fifty thousand (National Game Management Database, 2010). The aim of this research is to find out what kind of differences and resemblances can be found in feeding strategies at the examined plain habitats. The feed selection habit of one of the most important big game in our homeland has not been researched yet in detail in the counties Csongrád, Békés and Bács-Kiskun, where the roe deer population is numerous and excellent. The detailed knowledge of the related specific feeding strategies contributes not only to the better cognition of this kind but also provides a developed opportunity for the game managers to reach better game husbandry results.
Beyond the practical significance of the theme there are some other peculiarities to be cleared up in connection with the nourishment of roe deer. The practical and theoretical questions are what kind of feeding strategies would be typical and reasonable for the roe deer living on the plain at different seasons?

Keywords: roe deer, *Capreolus capreolus*, feed composition

INTRODUCTION

Gallery forest, wooded steppe and the scrubland are considered to be the ancient habitat of roe deer. They prefer leafy forests, forest edges and the bordering lawn or cultivated areas. On the enormous treeless plains they are not at all or only in limited numbers are found. The calmness offered by large scale field farming leads to area reservation of roe deer, this happened when they spread on the Great Hungarian Plain. It was also supported by the afforestation of the plain by forming forest belts and patches, namely the improvement of the habitat. The roe adapted to the agricultural environment very well. So in present days we separate the field and the forest roe ecotypes, which are different from each other in behaviour, social contacts and dietary habits (CSÁNYI, 1992).
Roe deer (*Capreolus capreolus*) has the largest population within the big game population in Hungary. Their nourishment was examined in several countries of Europe, and the abundance of available nourishing plants was highly emphasized (MÁTRAI et al., 1986; FEHÉR et al., 1988). The key factor of feed was not the quality but the accessibility. (TIXIER and DUNCAN, 1996; DUNCAN et al., 1998; TIXIER et al., 1997; 1998).

MATERIAL AND METHOD

The examinations were carried out at the hunting seasons between 2006 and 2009. For creating the database the samples were collected and registered from the dropped game in the hunting season of the doe (1st October–28th February) and of the roebuck (15th April–30th September). Altogether 436 roe deer (211 does and 225 roebucks) were examined and their data was registered (Table 1). In choosing the sample areas the main aspect was to find hunting territories on the Great Hungarian Plain which has different types of habitat, where

the quality of roe population ranked differently but they were not too far from each other. Besides it was very important that the professional hunters that helped during the collection of the samples should be reliable (Figure 1).

Figure 1.: The geographical location of the examined shoots
Source: National Game Management Database (2012)

Table 1. Summary table of the sampling locations, date and the quantity of samples

SAMPLES OF DOES DROPPED ON THE STUDIED AREAS				AGGREGATED DATA
Territory/Hunting season	**2006**	**2007**	**2008**	
Tiszaalpár	12	15	21	
Csongrád	14	16	15	
Nagyszénás	21	16	25	
Hódmezővásárhely	20	16	20	
Total	**67**	**63**	**81**	**211**
SAMPLES OF ROEBUCKS DROPPED ON THE STUDIED AREAS				
Territory/Hunting season	**2007**	**2008**	**2009**	
Tiszaalpár	18	16	25	
Csongrád	9	12	15	
Nagyszénás	22	17	25	
Hódmezővásárhely	23	21	22	
Total	**72**	**66**	**87**	**225**
Does and roebucks total	**139**	**129**	**168**	**436**

Source: National Game Management Database (2012)

The samples were taken from the hunting area Tiszaalpári Tisza Vadásztársaság (game management unit) (9,500 hectares, where the woody vegetation is floodplain forest, the forest cover of the area involved in the examination is more than 30%); the Bársony István Agricultural Secondary School of Csongrád (3,010 hectares of special function hunting area, the forest cover is 20%); the Petőfi Vadásztársaság (game management unit) of Nagyszénás (7,096 hectares, forest cover less than 1%) and the Szakszervezeti Vadásztársaság (game management unit) of Hódmezővásárhely (12,727 hectares, forest cover less than 1%). The estimated roe deer population of the territories involved in the examination is 1,800-2,000 animals.

The samples were investigated in the laboratory of the University of Szeged Faculty of Agriculture where the processing of data was done continually. To examine the feed of roe

deer we used the shedded microfibre method (MÁTRAI ET AL., 1986). To identify the plants forming the feed we put a histological collection together from the photographed epidermis of the plants which can be found in the growing season on the area. The epidermis is the most resistant fibre containing part of the plant, the structure of which stays almost the same after digestion. The sampled plant parts should be damaged with nitric acid than dyed and fixed. According to the specific features we put an adverbial key together to simplify the identification of the species which constitute the feed. The definition of the feed combination was made according to the examination of unique samples.

According to the works of DUNCAN ET AL. (1998), BARANCEKOVÁ (2004), and MÁTRAI ET AL. (2010) we made the following classification of the main feed components:

1. Monocotyledonous plants

The plants in this group are preferred feed sources on all the habitats we have examined, for example: sedges (*Carex spp.*), the Bermuda grass (*Cynodon dactylon*), the quack grass (*Agropyron repens*) and the meadow fescue (*Festuca pratensis*).

2. Dicotyledonous plants

In this group are the naturally grown dicotyledonous plants like the narrow leaf vetch (*Vicia sativa L.*), the hairy vetch (*Vicia villosa Roth.*), the Hungarian vetch (*Vicia pannonica*) are the most important ones. In this group are the spotted ladysthumb (*Persicaria maculosa*), the white campion (*Melandrium album*), the black horehound (*Ballota nigra*), the spiked speedwell (*Veronica spicata*), the common buglos (*Anchusa officinalis*), the white goosefoot (*Chenopodium album*) and the orange mullein (*Verbascum phlomoides*).

3. Woody plants and their sprouts

The young sprouts of woody trees are important feed sources on all the examined territories. Extremely important are black elderberry (*Sambucus nigra*), the black locust (*Robinia pseudoacacia*), the dewberry (*Rubus caesius*). Also preferred are the sprouts and the crop of silver berry (*Elaeagnus angustifolia*), the privet hedge (*Ligustrum ovalifolium*), the common hackberry (*Celtis occidentalis*), the field maple (*Acer campestre*), the manna ash (*Fraxinus ornus*) the English oak (*Quercus robur*) and the sessile oak (*Quercus petraea*).

4. Monocotyledonous cultivated plants and their crop

We have examined this group separately because it is a common feed source which needs more attention. In this group we can find the green parts and the crops of cultivated plants like bread wheat (*Triticum aestivum*), the common barley (*Hordeum vulgare*), the cultivated rye (*Secale cereale*), the triticale (*Triticale*) and the maize (*Zea mays*).

5. Dicotyledonous cultivated plants

The most important plants in this group are the fabaceae, like the alfalfa (*Medicago sativa*), the clover (*Trifolium spp.*), the black hay (*Medicago lupulina*), the rapeseed (*Brassica napus*) and the sunflower (*Helianthus annuus*).

The statistical data was processed by the statistics programs: SPSS for Windows (14.0 Standard Version), PASW 18.0 and by Excel. We have used the following method for the data evaluation. For examining the differences in the seasonal feed compound we have used Pearson's Chi^2-probe (χ^2).

RESULTS

During the annual evaluation of the studied feed components on all the sample areas it can be stated that the feed selection and the proportion of feed components of doe and roebuck in Tiszaalpár, Csongrád, Nagyszénás and Hódmezővásárhely was very diverse in every hunting period. Examining the fall-winter feed component of doe on the sample areas we can say that the rate of different feed components in the studied years varied significantly ($p<0.05$) only on Nagyszénás habitat (Table 2.). The consumption of woody plants was high in every year

(8.29–46.74%) regardless to the forest cover. On the territories we have examined, the consumption of woody plants was lower than in MÁTRAI et al. (1986), and MÁTRAI and KABAI (1989) on the Gödöllő hills, where roe deer consumption of woody plants in 70-100% consisted of 1-3 species.

Table 2. Annual comparison of the feed components of doe on the examined territories*

	Tiszaalpár		Csongrád		Nagyszénás		Hódmezővásárhely	
	2007	2008	2007	2008	2007	2008	2007	2008
2006	χ^2=3.3 p=0.507	χ^2=3.4 p=0.487	χ^2=6.7 p=0.150	χ^2=2.8 p=0.590	χ^2=10.5 p=0.032	χ^2=0.6 p=0.960	χ^2=1.2 p=0.872	χ^2=1.7 p=0.778
2007	-	χ^2=0.9 p=0.913	-	χ^2=0.9 p=0.925	-	χ^2=28.3 p=0.000	-	χ^2=1.5 p=0.817

*: df=4, in all tests

In case of the roebuck the rate of feed components in the examined years did not differ significantly only on the Tiszaalpár habitat (Table 3).

Table 3. Annual comparison of the feed components of roebuck on the examined territories *

	Tiszaalpár		Csongrád		Nagyszénás		Hódmezővásárhely	
	2008	2009	2008	2009	2008	2009	2008	2009
2007	χ^2=2.1 p=0.705	χ^2=6.4 p=0.171	χ^2=23.9 p=0.000	χ^2=15.7 p=0.003	χ^2=11.7 p=0.019	χ^2=9.4 p=0.052	χ^2=14.3 p=0.006	χ^2=19.3 p=0.001
2008	-	χ^2=2.5 p=0.634	-	χ^2=113.6 p=0.000	-	χ^2=33.5 p=0.000	-	χ^2=0.6 p=0.957

*: df=4, in all tests

From the results it can be stated that the diversity of the feed compound of doe on the examined territories is confirmed, the statistical difference in Tiszaalpár (between p=0.000 and p=0.021), in Csongrád (between p=0.000 and p=0.001) and in Nagyszénás (between p=0.000 and p=0.001), while it cannot be stated in the habitats of Csongrád and Hódmezővásárhely (in 2006 p=0.126; in 2007 p=0.767 and in 2008 p=0.676) (Table 4).

Table 4. Annual comparison of the feed components of doe on the examined territories *

	2006			2007			2008		
	Csong.	Nagysz.	Hmv.	Csong.	Nagysz.	Hmv.	Csong.	Nagysz.	Hmv.
Tiszaalpár	χ^2=31.6 p=0.000	χ^2=198.4 p=0.000	χ^2=35.2 p=0.000	χ^2=23.1 p=0.000	χ^2=60.3 p=0.000	χ^2=19.5 p=0.001	χ^2=14.7 p=0.005	χ^2=111.1 p=0.000	χ^2=11.5 p=0.021
Csongrád	-	χ^2=74.6 p=0.000	χ^2=7.2 p=0.126	-	χ^2=19.8 p=0.001	χ^2=1.8 p=0.767	-	χ^2=41.7 p=0.000	χ^2=2.3 p=0.676
Nagyszénás	-	-	χ^2=20.2 p=0.000	-	-	χ^2=18.2 p=0.001	-	-	χ^2=20.4 p=0.000

*: df=4, in all tests

In case of roebuck it is confirmed that the feed components vary on different habitats but in 2009 in Csongrád and Nagyszénás differences were not detected statistically. The feed preferences of the roe deer population on the examined territories differ in the hunting seasons of doe and roebuck according to the ecological conditions, agricultural cultivation and the rate of afforestation – was not confirmed on every occasion (Table 5).

Table 5. Annual comparison of the feed components of roebuck on the examined territories *

	2007			2008			2009		
	Csong.	Nagysz.	Hmv.	Csong.	Nagysz-	Hmv.	Csong.	Nagysz.	Hmv.
Tiszaalpár	χ^2=11.9 p=0.018	χ^2 =55.4 p=0.000	χ^2=41.2 p=0.000	χ^2=13.2 p=0.010	χ^2=63.7 p=0.000	χ^2=76.8 p=0.000	χ^2=23.5 p=0.000	χ^2=30.9 p=0.000	χ^2=78.8 p=0.000
Csongrád	-	χ^2=35.2 p=0.000	χ^2=35.6 p=0.000	-	χ^2=58.8 p=0.000	χ^2=253.8 p=0.000	-	χ^2=9.4 p=0.051	χ^2=47.4 p=0.000
Nagyszénás	-	-	χ^2=95.6 p=0.000	-	-	χ^2=123.8 p=0.000	-	-	χ^2=97.3 p=0.000

*: df=4, in all tests

On the studied plain habitats the consumption of the following woody plants was typical (2.40–12.26) the black locust (*Robina pseudoaccacia),* the elder (*Sambucus nigra)* (3.12–19.93%) MÁTRAI (2000) high consumption 60-90% of conifers (*Pinus spp.)*, cherries' (*Prunus spp.),* mulberry (*Rubus spp.),* the honey locust (*Gleditsia triacathos)* apples and grapes was detected. TIXIER et al. (1998) found the same dominant species in the winter feed only in smaller quantities (1–3) and smaller rate (22–50%).

According to the researches of MÁTRAI (2000) on temporary habitats the presence of the main feed components was even higher. Besides the conifers the maple (*Acer campestre)*, the oak and the ash (*Fraxinus spp.)*, the alfalfa (*Medicago sativa),* the carrot (*Beta spp.),* the honey locust (*Gleditsia triacathos),* the silver berry *(Elaeangus angustifolia)* were also present.

On the studied plain habitats the examined doe liked the monocotyledonous plants because they were found in large quantities (40.15–74.14%) which were very important in the winter period, like in the studies of MÁTRAI (2000) where she stated that on field habitats the feed selection of roe deer only differed in the consumed plants and not in their distribution. She stated that the dominant feed components were the parsley (*Petoselium spp.)*, the carrot leaf (*Beta spp.),* the flowering plants (*Medicago spp. and Trifolium spp.),* the wheat (*Triticum spp.)* and the barley (*Hordeum spp.).*

While studying the feed selection of roe deer on Moravian agricultural habitats HOLISOVA et al (1982) received the same results in fall and winter periods, where the main feed components were the winter cereals and the corn, but she also underlined the importance of mulberry (*Rubus spp.),* privet (*Ligustrum vulgare),* ash (*Fraxinus excelsior)* (47–68%).

Examining the feed components of roebuck we can state that the rate of the monocotyledonous plants was low (2.32–29.06%), mostly were consumed the quitch grass (*Agropyron repens),* Bermuda grass (*Cynodon dactylon)*, the sedge *(Carex spp.).* In the case of dycotiledonous plants we have found the same results (2.00–24.75%), the common bugloss (*Anchusa officinalis)*, the hairy vetch (*Vicia villosa),* the black horehound (*Ballota nigra)*, the goosefoot (*Chenopodium album),* the mullein (*Verbascum phlomoides),* the hawkweed ox-tongue (*Picris hieracioides)*, the common gypsy-weed (*Veronica officinalis)* were consumed.

CONCLUSIONS

The consumption of woody plants was dominant from spring till fall (24.86–52.80%), there were no significant differences between the years, mostly eaten plants were the black locust (*Robinia pseudoacacia)* and the elder (*Sambucus nigra),* these results correspond to the results of STRANDGAARD (1972) on agricultural habitats of Kaløn (38–74%). According to the examinations made by SZMIDT (1975) the common beech (*Fagus sylvatica)* was the most preferred woody plant. The most disliked plants in the winter period were the pine (*Pinus*

sylvestris) and the elder (*Sambucus nigra)*. The common beech was a favored species according to numerous writers (WAGENKNECHT, 1969) or at least it was consumed periodically (KLÖTZLI, 1965).
The elder was consumed less according to PIELOWSKI (1970), but also there were researchers who stated that it was a frequently consumed plant together with the pine (KURT, 1970).
KURT (1970) says that in spring and summer 62% of the consumed nourishment is of leaves and sprouts of woody plants and in winter period this rate can be even 80%, which cover not only the energy needs but also the water needs of roe deer, states SZCZERBINSKI (1964). In summer period this plant group provides 50% of the feed consumed and it is very important in digestion regulation (BUBENIK, 1959).
The monocotyledonous crops were also preferred by roebuck, the common wheat (*Triticum aestivum)*, the barley (*Hordeum vulgare)*, the rye (*Secale cereale)* were also consumed as we have found them in large quantities in the samples (12.63–49.28%).
The rate of dicotyledonous crops was between 4.03–15.94%, mostly the Fabaceae were consumed like: alfalfa (*Medicago sativa),* the white clover (*Trifolium repens),* the red clover (*Trifolium pratense),* and in spring the rape (*Brassica napus).*
But in spring and summer there was a great diversity in the samples in the same growing season the consumption of 17–21 plant species – mostly dicotyledonous plants, the leaves and sprouts of woody plants and cultivated crops were dominant. On all territories there were 1–3 mostly preferred woody plants (acacia, elder, narrow-leaved willow, hackberry) which is almost similar to the result published by TIXIER and DUNCAN (1996), where the authors raised the attention to the fact that there is great diversity in the feed of roe deer on identical habitats. Their opinion is that plant species which can be found on the habitat significantly affect the feed selection of roe deer. According to their results roe deer consumed 305 types of plants in the growing season the most preferred plants were the leaves and sprouts of woody plants.
We can state that after examining the main feed components, the feed selection of roe deer in the same year but on different territories was very diverse thanks to the conditions of the regions and their various feed supply. In the periods when there is less feed, according to the results on different plain habitats we can say that the dominant plant species consumed by roe deer are similar. The feeding strategy was the same on all habitats: roe deer consumed those plants which were in abundance. They did not leave the forest or the agricultural areas to find easily digestible, nutritious perennial plants. According to the latest researches of MÁTRAI (2006) roe deer must save energy in the winter, because of its smaller size needs more energy per body weight than the red deer. The search and consumption of easily digestible feed was not typical on the examined plain habitats because these plants are not available all year long. In the periods of feed shortage the consumption of easily accessible plants was dominant.

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THE EFFECT OF ORGANIC RESIDUES' CO-FERMENTATION ON BIOGAS POTENTIAL OF DIFFERENT SIZED ECONOMICAL UNITS

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ABSTRACT
The degradable biomass potential is available in diverse and different combination in the establishing firms' environment in Hungary. In the case of proper preparation the biogas production and utilization operating for energy recovery in all sizes of agricultural enterprises will improve the economy, on the other hand, it is a powerful tool of the waste management. My investigations were running on the pilot farm of the MGK to define the conditions of deconstruction of the wastes of agricultural production on family economical level, the renewable energy options the decomposition of the by-products on micro-regional level. I determined the biogas production potential of biomass with partly measured, partly based on literature data of the 50 dairy cow farm, respectively the sample utilized for pilot farm, and then I completed the same on sub-regional level. On the size of pilot farm the composition of the substrat were expanding of cheese factory wastewater and pig straw manure additives. The large-scale manure production modelling of biogas experiments used liquid pig slurry as raw material. The additives: bran, mushroom compost, maize silage. The industrial by-products and wastes suitable for biogas production are defined by the dry matter, organic matter, nitrogen content, C: N ratio, specific gas yield.

Keywords: biogas potential, organic waste, different sized agricultural farming

INTRODUCTION

Biogas technology is spreading primarily in wet version for the liquid slurry technology with big investments by big investors, while the new environmental regulations make it possible for small farms only the straw farming methods. My goal is to prove that the straw manure - washing water of milking parlour substrate utilizable for energy purposes.
Among certain structural conditions of a given small region is important the energy utilization of manure and other waste by-products because the serious impact on the environment, significantly increases the profit-making ability of agricultural investments. The efficient operation of the breeding of pigs particularly requires the increasing of the plant size, leading to a significant increase of environmental damage. The multiple beneficial use of biogas (energy production + environmental + investment + biomanure production of hazardous waste management and utilization) is possible if the potential additives energy-producing ability previously modelled experimentally and the operating conditions are similar. The experiments with varying load were simulating varying substrate compositions, respectively the changing of manure production. The intensity of the methane production is the direct measure of the activity of the methanogenic bacteria and the digester performance is a highly sensitive, specific criteria (ROSS ET AL, 1996). The produced gas composition and yield are features that are useful in assessing the stability of the anaerobic system. The results of the tests are essential, and the territory of the investments and operational areas bring practical benefits.

MATERIAL AND METHOD

The straw manure experiments was running with 50dm^3 volume/fermentor, mesophilic temperature (38°C), batch process, first manually mixing, then finished with mixing machine, built-in digester system in the building of the SZTE MGK. The formed biogas emptied daily, I measured the amount of gas and its methane content.

At the Engineering and Agricultural Faculty of Szolnok College is available an appropriate, semi-automatic experimental system, representing the operating circumstances, providing similar conditions. It is suitable for the formation process of the biogas, changing of influencing factors and all of necessary measurements of typical data. I dosed 50 dm^3 of liquid dung mixture for treatment to take the factors in connection with the capacity of the fermentor into account. I applied the continuous (filling up) system, which is most widespread in the practice (ARTHURSON, 2009). It can be reproduced the process sections, as the launching, load change, receipt change. According to certain expert opinions each single daily measurement combination for a separate experiment can be qualified.

The technology of continuous fermentation experiments

We may split the process of the fermentation into sections according to Table 1.

Table 1. Technology of co-fermentation experiments

serial number	1.	2.	3.	4.
period of the process	stabilization	refilling period with fresh substance	Running-up period	Comparative experiments
treatment		running-up period with fresh substance		
duration time	7 days	14 days	21 days	21 days

Source: Kalmár ET AL (2007)

Calculation of the impact of the co-fermentation of the pig manure and wheat bran enhancing biogas production at sub-regional level

I calculated with 5t/ha yield of wheat for 15000 wheat area in the Hódmezővásárhely micro region that means 75000 t crops. 20% bran production can be calculated approx. in the industrial grain processing. The total amount of wheat grain processing industry appr.15000 t bran was formed.

RESULTS

CO-FERMENTATION OF ORGANIC WASTE OF FAMILY-SIZED DAIRY FARM

In the first experiment it was postulated that the milking parlour, milk cooling equipment used cleaning laundry disinfectant in water prevents the rich manure anaerobic metabolism, reduces the methane formation. The rate of formation of the fermentor can be found in most types of organic waste generated by weight, but assuming different situations, multiple assembly is simulated. According to the data shown in the second Table the 11% higher dry matter content of the fermentation substrate caused 6.91% higher gas releasing, or 8.48% more methane content resulted. The literature (10Ndm^3/d/om.kg) compared to 57, respectively 52% higher gas production is found. Dry weight basis did not increase the efficiency of investment, however, for improved utilization of the device (0.29 <0.32 Ndm^{3}methane/dm^3 digester / day) (*Table 2*). 5.43% dry matter content of the substrate, the maximum daily production of biogas 85Ndm^3/d, methane content 56%, and 6.03% dry matter

content of the substrate, the maximum daily production of biogas 73 Ndm^3/d, 49% methane content.

Table 2. Results of experiments for energetic utilization of organic wastes of SZTE MGK organic waste

Measured and calculated parameters		organic waste of pilot farm		organic waste of family sized dairy farm	
		cattle straw manure: 14,5kg; *pig straw manure:*8,2kg; *waste water of cheese firm (*without whey*):* 23,4kg; *waste water of milking parlour:* 3,9kg		*cattle straw manure:* (dmc.: 21,3%; omc.: 12,9%);	
				3. reactor	4. reactor
				12734 g;	14137 g;
				waste water of parlour: dm.c..: 1,52 g/l; omc..: 0,592 g/l;	
		stored	fresh	37266g;	35863g;
dry matter content (dmc.) (%)		9,51	9,92	5,43%	6,03%
organic matter content (omc.)(%)		6,21	6,41	3,30%	3,66%
average gas production (Ndm^3/day)	biogas	27,2	56,04	26,05	27,85
	methane	14,69	27,46	14,63	15,87
average methane content (%)		54	49	56,18%	57,0%
theoretical biogas production (Ndm^3/day)*		48,2	48,2	16,5	18,3
average gasyield referred on specific fermentor volume (Ndm^3/dm^3/day)	biogas	0,54	1,12	0,52	0,56
	methane	0,29	0,55	0,29	0,32

**referred on 20 days fermentation; mezophilic, intermittent method, 200Ndm^3/20days cattle, 445Ndm^3/20days pig manure referred on organic matter content.,* [KALTWASSER (1983)]

BIOGAS PRODUCTION OF CO-FERMENTATION CONSIDERED BY ORGANIC WASTES OF PILOT PLANT

The fermentation experiments designed to demonstrate the biogas technology can find a solution for common problems (waste management, energy supply, etc) of small family-sized farms be located on a certain district. The gas releasing of the room temperature stored, partially out of the reach the air of the pilot farm recipe of organic waste compared to the performance of fresh manure (1.12 Ndm^3 / dm^3/nap), less than half (0.54 Ndm^3 / dm^3/nap) produced, because of the degradation processes have been started. The anaerobic conditions have developed rapidly since the methane is also a surge in the second and third day has been completed (*Figure 1*). The highest gas formation of the stored manure was 63 Ndm^3/day (1.26 Ndm^3/dm^3fermentor/day), while the fresh manure 94 Ndm^3/day (1.808 Ndm^3/dm^3 fermentor/day).The average methane content of fresh manure mixture (49%) five percent had less than a year and a half contained substrate (*Table 2, Figure 2*)

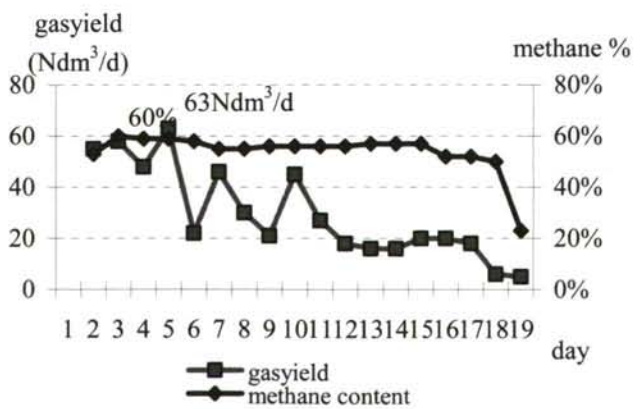

Figure 1. Formation of biogas from straw manure stored at room temperature

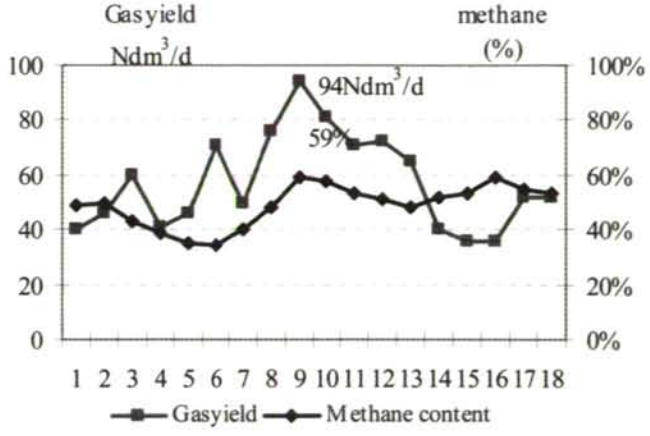

Figure 2. Formation of biogas from fresh straw manure

Wheat bran usability testing for biogas yield enhancement

The first test phase: overloading technology, new material loading (15 days, from the 37. days till the 51. days):

Two reactors daily charged with 6.6 vol. % fresh slurry and into the second no. 60g bran per day were dosed frequently. The gas production of the untreated (control) reactor (third digester) was much less than the other liquid pig slurry-based biomass in that given period. In most cases did not reach the half of the gas production of the treated reactor. The average gas production was 24 Ndm^3 biogas/dm^3/day in the control reactor. The mill bran dosed second digester's gas production is in the over filled period more or less different. The reason can be the changing of the dry matter content of the fresh organic manure. Operating conditions to model the different dry matter content of fresh slurry was applied. The filling used in low solids fresh organic manure occasionally caused fluctuations in gas production.

Table 3. The average gas production with the addition of wheat bran

Second fermentor: 6.6 vol.% of fresh slurry +60 g bran; third (control) fermentor: 6.6 vol.% of fresh manure;

Measured value, technology		Average gasyield (dm^3/day)/ specific values *(Ndm^3gas/day, Ndm^3gas/dm^3/day)*				
		2. sz. fermentor *(+60g dm.. bran)*	3. control	Gasyield referred to control	2. fer-mentor	3. control
		6,6 vol. % fresh liquid manure			specific fermentor volume referred gasyield(dm^3/ dm^3/day)	
biogas	Fresh substrat load	62,7 Ndm^3/day	24,2 Ndm^3/day	2,59	1,25	0,48
	recirculation technology	42 Ndm^3/day	10,1 Ndm^3/day	4,16	0,84	0,20
Methane yield	Fresh substrat load *Ndm^3/day*	35,9 Ndm^3/day (57,26%)	13,2 Ndm^3/day (54,54%)	2,72	0,72	0,26
	recirculation technology	24,2 Ndm^3/day; (57,62%)	6,3 Ndm^3/day; (62,38%)	3,84	0,48	0,13

The gas production of the No. 2. digester in the second test period already reached the 50 day dm^3/day production, and an average of 62.6 dm^3 biogas produced per day (Table 3, Figure 3).

The methane content of biogas reactors was produced in all cases exceeded 50% and sometimes even 60% (*Table 3, Figure 4*).

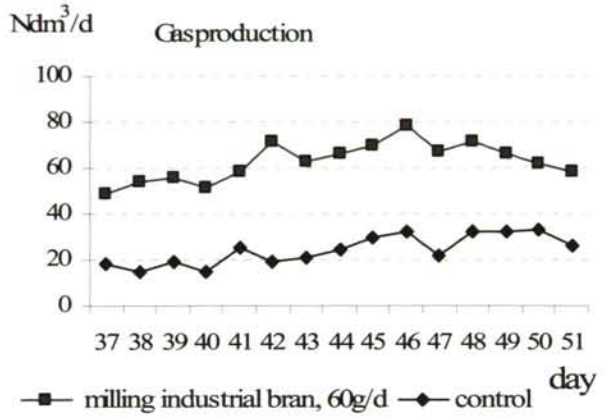

Figure 3. Gas production during fresh material loading technology (15 days, from the 37. days till 51. days)

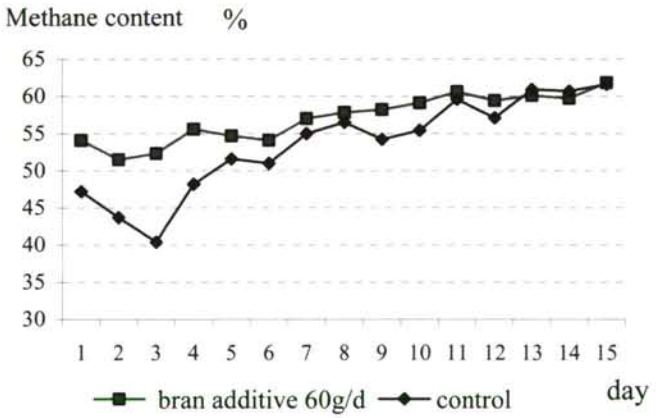

Figure 4. The methane content of biogas was produced in reactors, overloading technology, with new material

The estimated production of pig manure of Hódmezővásárhely micro region is 66,094 tonnes. The heating value of gas production is 71,480.4 GJ / year from this. This heat quantity can produce 7211.7 MWh / year of electricity. The increasing value of co-fermentation using 66,094 * 0.0012 = 79.3t bran produces 19,615.82 MWh / year electricity.

CONCLUSIONS OR DISCUSSION

The milking cattle manure and sewage of more than 50% higher gassing found compared to the data in the literature with two option (0.55 >> 0.32 Ndm^3methane/dm^3 fermentor volume / day). In relation to the wastewater of the milking parlour and the cheese factory, the cattle and pig manure dosing in proportion of the forming, the gas release of fresh manure is 16% higher then the data in the literature. The half-year stored manure has 43.6% less gas production compared the fresh. The study shows that 10.14 m^3 per day at the pilot farm plant scale size and 4.26 m^3 per day biogas formed at the dairy level. The improved thermal energy equivalent of biogas was 84.97 MJ/day at farm level, at the pilot farm level is 173.97 MJ / day. The electric power value is 0.34 kW, respectively 0,7 kW. The heating power which is the by-product of the digesting process is 0.23 kW, respectively 0.47 kW.

The wheat bran (by-product from the milling) increased biogas yield were examined. The 45g dmc./day/digester bran loading with 4% dmc liquid pig slurry basis, released 0.72 dm^3

methane/dm^3/day, which is almost tripled (2.72), compared to the methane production of the liquid pig manure control.

From the total amount of pig manure with the five-thousandth of the total wheat bran quantity co-fermented can be obtained 122,946 GJ /year of biogas heating value surplus, 12,404.12 MWh /year of electricity surplus at the micro-regional level.

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SCIENCE PARKS IN CITY REGIONS AFTER THE GLOBAL ECONOMIC CRISIS

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ABSTRACT
We now live in a global knowledge economy where governments are investing to boost innovation, science and technological development. Their aim is to help position cities and regions to be competitive in the context of the current global economic change. The regional dimension is important. National policies create a framework for innovation but the locus of much innovation is at the regional and local level. Experience in the exploitation of technological innovation to support regional and local economic development has grown, and good practice relating to this process is much better understood. Innovation and collaboration are the keys. Isolationism through protectionism around domestic markets serves no one in the long term. The promotion and exploitation of innovation depends on research funded by both government and industry, as well as user-driven research. It also depends on high volumes of knowledge transfer and relationships between lot of international institutions collaborating formally on research in general or on specific scientific challenges. The main objective of the present study is to analyse through international, especially British experiences the possible development impacts to the city region of knowledge-based urban areas elsewhere in Europe.

Keywords: city regions, science park, innovation, knowledge transfer

INTRODUCTION

Globalizing processes are having diverse impacts on major urban areas, and as a result, urban policies will have to move beyond the familiar focus on urban problems so as to help cities benefit from, as well as cope with the implications of globalization. First, the paper examines some of the key components of globalising processes and what this means for different types of cities and urban regions. What is the role of cities in regional competitiveness and how can current territorial and urban policies be drawn together more effectively? This focus can also add to our understanding of soft policy instruments -- for example in higher education, skills, innovation, enterprise and social policy areas -- can be reconfigured in order to face these challenges more effectively, and to get a sense of what needs to change and why. In this study, the role of universities is reviewed, as large, globally-networked, but locally situated actors, in addressing particular problems faced.

SIGNIFICANCE AND METHOD

Increasing importance of knowledge capital has changed the nature of urban hierarchies, particularly increasing the importance of the mega-city. The most productive location for investing in knowledge is in existing knowledge capital concentrations. Beneath these mega-cities in the new urban hierarchy, traditional regional urban centres have become differentiated between core metropolitan areas and peripheral urban zones. However, there is a problem for peripheral urban zones, remote from core metropolitan areas and unable to develop close linkages to other successful places. Such towns and cities might once have specialised in manufacturing or food processing, but the attractive power of core cities hinders building dynamic knowledge-intensive clusters in those locations. An urgent planning challenge is 'finding a place' for such cities and their regions in the knowledge economy,

which has eroded these places' past rationale without providing a clear future for them (BENNEWORTH – HOSPERS, 2007).

Firstly, a number of traditional regional centres have successfully adjusted to the knowledge economy, developing strong networks around themselves where they pool and combine their knowledge capital with other places. Secondly, universities exist within global knowledge production networks which could provide access to external knowledge capital. They allow peripheral places to reinvent and renew themselves as well as offering potential capacity to invest in transformational activities in peripheral regions.

In this study, these two issues are brought together to consider roles of universities in helping peripheral city-regions adjust to the competitive pressures of knowledge economy. It is focused on one particular domain, universities roles' within regional governance networks in mobilising development coalitions, which help produce particular development projects which help such places adjust to these new realities. It is begun by presenting a theoretical framework for understanding the problems faced by less successful regions which lack a ready to made solution to the problems of peripheries in the knowledge economy, and the role of the university as a connected, global or local actor.

RESULTS AND DISCUSSION

Knowledge capital has promoted the rise of world cities, massive agglomerations in which a range of knowledge-intensive business service (KIBS) sectors interact producing complex systems of competitive advantage. Places like Aalborg in Denmark and Oulo in Finland have built up strong regional complexes of internationally competitive industry, but in many cases they have not been associated with a more general transformation of the regional economy. Larger cities also lie at the centre of networks of transport and communications that help to encourage external investments, which further reinforces their strength. Promoting regional development in the knowledge economy therefore appears requires concentrating particular types of knowledge investments into high-profile urban centres. The strength of London is dependent on a very strong economic situation that spreads well into the surrounding local counties. Policy-makers have attempted to strengthen provincial cities by building linkages to other such cities to develop critical mass across a shared hinterland (BENNEWORTH – HOSPERS, 2007).

Strong connections between knowledge producing activities (e.g. universities, government research laboratories and business R&D centres), and knowledge users, innovating businesses which embed local knowledge within exported products. Universities create new knowledge, challenge existing knowledge, diffuse and circulate that knowledge, exchange it with other academics, transferring it to businesses and teaching it to students. It is acknowledged that universities function in a very different knowledge creation environment to the earlier Fordist period, where universities provided basic science then commercialised by large vertically integrated businesses.

Universities as development actors in urban places are focused on, how the ways they rebuild and reinvent themselves institutionally and physically changes their contribution to their host cities, and whether this helps to redefine the position of these peripheral cities in their wider urban hierarchies. I am interested in exploring this through the interaction between universities and their governance networks. BENNEWORTH and HOSPERS (2007) suggest an ideal type local governance arrangement which could add value to the regional knowledge economy, with universities and other local actors working together effectively to create a knowledge laboratory, where the host cities have more high quality knowledge-intensive

investments that supports the regional knowledge economy. This also represents a de facto elevation of the host city within functional urban hierarchies.

Regional governance actors have begun to reorient themselves to exploit universities' capacities and potential. Whilst universities began their reinvention from small experimental projects, other regional actors' attempts to enrol those successes began from the opposite direction, starting with the ambitious concepts and eye-catching 'hybrid projects'. However, the transformations of governance networks have not been unproblematic, and the pathways by which governance arrangements have evolved provide insights into local, urban and regional governance processes in the knowledge economy.

GREENE ET AL (2007) in a study comparing 22 composite indices benchmarking cities and city-regions, he found many inconsistencies in theorising and measuring spatial competitiveness. In BERGER's (2011) opinion academics should work on the theoretical basis of regional competitiveness to bring back the discussion to regional development and not focus solely on regional competitiveness as a pure benchmarking topic.

It can be argued that regions and cities that do not adapt to the requirements of post industrial knowledge-based economies suffer from absolute disadvantages. It is argued here that this is theoretically inadequate and it is shown that, over several decades, this tendency is not supported by available empirical evidence for UK urban and regional economies. This leads to the argument that it is necessary to look elsewhere for theoretical explanations of the observed divergence in post-industrial knowledge-based economies. For us, dynamic evolutionary economic theory combined with endogenous growth theory offer much better prospects for explaining economic change in such economies.

Turning first to evolutionary theory, it offers an explanation of economic change in general that can be extended to understanding spatial economies in fundamentally different ways from neo-classical theory. Urban and regional economic development is not some unhistorical phenomenon, but a historical process rooted in the conditions and contexts of particular times and places. Furthermore, those conditions, especially institutional, social and technological conditions, are not exogenous, as assumed by orthodox neo-classical economic theory, but are endogenous to, and part of the process of, economic evolution itself.

One of the most significant elements of an evolutionary approach to understanding urban and regional economic development identified here is the capacity of spatial economies to adapt and innovate. These are essential dynamic processes in the ability of open economies to succeed in the context of powerful external sources of change.

Endogenous growth theory provides a systematic approach to understanding the crucial element of the adaptive capacity of spatial economies. Given that it is impossible to cover the whole rich spectrum of the dynamic evolutionary approach to economic development in a single paper such as this, the remainder of this analysis will be focused on the adaptive capacity of spatial economies and the insights offered by endogenous growth theory in understanding this particular element of evolutionary theory and how it can contribute to understanding the economic divergence of regions and cities.

Two main types would seem to be of most possible relevance to explaining the adaptive and innovative capacity of regions and cities: those intentional human capital models that stress the importance of education, learning by doing and spillover of knowledge; and Schumpeterian innovation models of purposive profit-seeking research and development (R&D) by firms. The first group of models portray technological progress as the result of intentional research and education, and introduce human capital into the production function.

Endogenous growth theory also suggests that regions/cities that start with the most of the assets outlined above are most likely to accumulate more of them over time. SIMMIE and CARPENTER (2008) following this line of reasoning, endogenous growth theory also suggests that cities (or regions) that have 'first mover advantage' in terms of innovation and

technology are likely to attract educated labour and capital from elsewhere, thereby producing a cumulative, self-reinforcing process of research and development leadership.
As London has significantly more higher education institutions than all other United Kingdom regions, it is important as well as a good chance to analyse the spread and concentration patterns of both knowledge-based venturing and finance provision across higher education institutions of the region, in order to understand the reasons underlying the region's relatively poor performance when compared with these other regions. It is concluded that although London has a higher concentration of higher education and finance institutions than other United Kingdom regions, there is no evidence that as a whole they are better connected or create and contribute to higher levels of university knowledge-based venturing. Five factors were given an equal weighting in generating an index of knowledge commercialisation (HUGGINS, 2008), consisting of:

- the number of patents registered;
- the number of licenses granted;
- number of spin-offs created;
- the number of projects requiring seed funding; and
- the overall demand for seed funds.

Once the index was constructed, the higher education institutions were placed into three groups: top ranked; middle ranked and bottom ranked, by order of their commercial activities, with the possibility of achieving a score between 0 and 100 (see *Table 1*). The top ranked higher education institutions scored 90.0 and the lowest a mere 2.5, with the mean average score being 39.5. This ranking system enables further analysis and differentiation of the issues and requirements appropriate to each group.

Table 1. Knowledge Commercialisation Ranking and Index Parameters for higher education institutions in London

Ranking Group	Ranks Covered	Mean Average Score (%)	Index Score Range (%)
Top	1-5	76,5	70-90
Middle	6-13	50,9	35-65
Bottom	14-25	16,5	2,5-32,5
Overall	1-25	39,5	0-100

Source: derived from HUGGINS (2008)

A "premier league" of universities has formed in London, which runs the risk of ignoring the commercial exploitation value of innovations and ideas emerging from universities ranked in lower divisions of London. In terms of the differing approach adopted by London's universities towards knowledge commercialisation across the three ranked groups, one of the key differences is the presence within each university of unit, office or company dedicated to the management of know edge-based venturing. Of the top-ranked universities on the index of knowledge commercialisation, 80% have established a specific entity aimed at managing the commercialisation of research, compared with only 25% of the bottom ranked universities.
The differential in knowledge commercialisation performance across universities of London suggests that the poorer performing universities may have more barriers to navigate. It is important to interpret from HUGGINS' (2008) survey the lack of time factor highlighted by higher education institutions respondents of London as a barrier to involvement in knowledge

commercialisation processes. For the higher education institutions ranked at top of the knowledge commercialisation index the most significant constraint is a lack of management skills (80%). This suggests that these higher education institutions have much of the infrastructure requirements for knowledge commercialisation already in place, and are now in a position where it is human capital factors that are the focus of continuing and improving their know edge commercialisation capabilities. Amongst the bottom-ranked higher education institutions the most important barriers were the lack of time (83%) and management skills.
The main and secondary sources of seed financing accessed by higher education institutions in London responding to HUGGINS' (2008) survey are shown in *Table 2*, which indicates that finance is drawn from a variety of internal and external sources, with many institutions accessing funds from several different sources. The most important funding sources are specialist funds created and funded within higher education institutions.
The University Challenge Fund (UCF) was the next most important source, and was the main source of funding for one-fifth of all higher education institutions. The University Challenge Fund is the most important United Kingdom national policy development relating to seed financing university knowledge commercialization. The purpose of the University Challenge Fund is to enable universities to establish seed funds for early-stage knowledge-based venturing.

Table 2. Sources of Seed Financing for Higher Education Institutions of London

Source of Finance	**Main Source (%)**	**Secondary Source (%)**
Specialist Funds Created by the HEI	36	48
University Challenge Funding	20	32
Higher Education Funding Council for England	12	44
Private Sector Seed or Venture Capital	8	36
DTI Grants or Loans	4	44
EU Programme Funds or Loans	0	20
Welcome Trust	0	16
Other Charity, Trust or Research Foundation	0	8
Other	0	4

Source: derived from HUGGINS (2008)

Less than two-thirds (63%) of the middle-ranked higher education institutions and only 33% of the bottom-ranked higher education institutions had accessed two or more funds. Private sector seed or venture sector capital is the main source of finance for only 8% of higher education institutions in London and a secondary source for 36%. Almost two thirds (64%) of responding higher education institutions stated they had no experience of private sector involvement in gaining seed financing for their knowledge commercialisation activities. Private sector involvement was most commonly through the provision of equity in return for seed financing. This was most frequent among the top-ranked universities, with 60% being

involved in seed financing through private equity staking. According to HORVATH and BENKO-KISS' (2011) investigation almost one third of the enterprises is willing to increase their own sources while less than 20% can undertake the rise of liabilities. They analysed agricultural companies in Hungary but their results reveal the main characteristics of the general investor attitude. However, only one institution had experience of gaining finance through corporate venturing – a very low figure given the strength of the region's business sector.

More surprisingly, perhaps, is the finding that 50% of the middle-ranked HEIs have also had involvement in this mode of seed financing, highlighting their increasing willingness to undertake knowledge-based venturing of this kind. However, none of the bottom-ranked universities surveyed had accessed any form of private seed funding. The private sector financiers interviewed stated that if they consider investing in the higher education sector, they only seek "low hanging fruit", and the relative concentration upon the top-ranked universities is evidence of such a focus. The relationship between private funding and public seed financing can be analysed by attributing scores for public and private funding for each institution, and then testing the hypothesis that private sector seed funding for knowledge commercialisation is more likely to be accessed if public funding is already in place. There was considerable agreement among Huggins' interviewees that public sector funding acts as a signal for private sector involvement, i.e. the probability of investment from the private sector rises with the amount of public funding secured, as explained by one interviewee: "Matched funding is used as a signal – with investors much more likely to become involved in a project that is backed by government money, as the risks of involvement are reduced."

In general, private sector investment in London comes either from venture capitalists or business angels; major banks are very unlikely to invest in university ventures, and will only lend money once significant equity is in place. All interviewees were of the view that any public sector investment in higher education knowledge commercialisation should retain a private sector dimension. When probed, interviewees generally stated that seed funding does not appeal to the majority of London's venture capitalists and business angels unless there is a level of public sector involvement. When probed about the nature of any future public sector involvement in seed financing for higher education institutions in London, interviewees were generally of the view that funds should contain some form of intra-fund stream relating to specific disciplines and sectors, since their requirements are often varied in terms of: the amount of investment required; the level of investor patience required; and the necessary management skills required – both current and future.

Overall, there is a requirement in London to broaden the focus of financing university knowledge commercialisation activities beyond the upper tier of higher education institutions if the region is to fulfil its economic objectives, particularly as a key driver of the knowledge economy in United Kingdom. From the views provided by interviewees, it can be suggested that information asymmetry and a resulting lack of suitable risk intelligence among potential private sector investors are having a negative effect on knowledge commercialisation processes in London's higher education sector. Similarly, potential investees do not have access to the relevant networks and intelligence needed to make an effective case for financing, and therefore cannot effectively demonstrate their ideas.

A number of interviewees in London provided evidence of higher education institutions projects that should have been able to attract private sector financing, but were instead "put-on-the shelf" due to a lack of effective engagement with those financiers capable of making a significant investment. Many of the interviewees – who can be considered as key players in the region - stated that they do not have a complete view of all the relevant actors, and that much of the total London network remains uncharted.

Indeed, for the most important players – both financial and academic – the level of diffusion is global, with many of London venture capitalists dealing purely at an international level, and the leading universities establishing commercial alliances with other leading universities and multinationals from around the world. However, as we have already seen, higher education sector of London has a long tail with a lack of strength in depth concerning successful involvement in knowledge-based venturing. This responsibility has largely fallen to the Technology Transfer Offices, which in a number of institutions are still embryonic. As we have already seen, the capability of these offices to operate effectively within a highly commercial environment is often considered to be below the level required by the finance community, which within London can be assumed to be even more demanding in less finance-centric cities and regions. One banker interviewed, who had experience of trying to broker deals in the region, explained: "Evidence from our dealings show that venture capitalists consider the timescales of the decision-making within universities to be too slow. Both venture capitalists and the universities indicate that the Technology Transfer Offices are under-resourced and can do very little for both sides of the fence" (HUGGINS, 2008).

Substantial spin-off and other commercialisation activities are restricted to only a small number of higher education institutions, highlighting the existence of a large knowledge commercialisation divide across higher education sector of London. Despite the density of both higher education and finance institutions in London, the interface between the two is fragmented and limited in its depth. It is often assumed that core economic regions possess an advantage over their more peripheral counterparts due to the existing and embedded intra-regional networks and interdependencies between economic and knowledge creating actors.

With regard to university-finance networks in London, this does not appear to be the case. Although London has a higher concentration of higher education and finance institutions than other United Kingdom regions, there is no evidence that as a whole they are better connected or create and contribute to higher levels of knowledge-based venturing. In terms of potential regional policy intervention in London, it is noticeable that the region currently lacks any form of knowledge commercialisation champion that is enabled to strategically influence the interaction between higher education institutions and the finance or business community. Such a strategic champion could not only act as the key facilitator of interaction between the business community and higher education institutions, but also map potential financing routes, co-ordinate university processes, and raise awareness of higher education knowledge commercialisation activities. The key feature of such a champion would be to work on behalf of all higher education institutions, both through and across existing networks and routes of interactions. In other words, the role of the champion would not be to displace or duplicate existing networks, actors/stakeholders, or initiatives/programmes, but to work effectively with them in a complementary and supporting manner. This could be achieved through the establishment of a regional academic-finance network co-ordinated by the champion.

This network should operate as a means of introducing potential academic entrepreneurs and their technology transfer officers to investors, business intermediaries (both public and private sector), as well as to other academic entrepreneurs and institutions. Furthermore, the development of databases drawing together a range of intelligence on the managers and mentors capable of working with academic entrepreneurs would reduce the search and transaction costs of accessing managerial expertise and increase the probability of acquiring appropriate type of expertise.

CONCLUSION

Universities should be very important actors within knowledge societies, as their purposes are intimately related to knowledge, learning and innovating. The absence of local absorptive capacity raises the question of whether universities can create forward and backward linkages so that regions can benefit collectively from knowledge spill-over arising from the knowledge circulating around universities. Economies that remain locked-in to old economic, technological and institutional forms in the face of such external change are likely to decline, sometimes with catastrophic consequences. In contrast, spatial economies where there is adaptive capacity to develop new forms of economic, technological and institutional arrangements in the face of key external sources of change in post-industrial economies, are most likely to lead to economic growth in knowledge-based information economies.

The University Challenge Fund is the most important United Kingdom national policy development relating to seed financing university knowledge commercialization. Such kind of funds would be very stimulating for the sake of the increasing significance of knowledge-based ventures. The lack of effective interaction networks between the higher education institutions and the business community can appear to have a negative effect on the commercialisation of knowledge not just in terms of financing, but also in terms of exchanging expertise and experience.

In order to improve the management of commercialisation processes, the network could be mobilised to create a far more co-ordinated approach for identifying and promoting suitable managers and mentors. Furthermore, the development of databases drawing together a range of intelligence on the managers and mentors capable of working with academic entrepreneurs would reduce the search and transaction costs of accessing managerial expertise and increase the probability of acquiring appropriate type of expertise.

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ROLE OF SOCIAL CAPITAL IN RURAL SPACES

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ABSTRACT
Rural areas have a number of unique features which make it noticeably different from urban areas. This fact is also shown by the presence of certain processes. Furthermore, not only in urban areas but also in rural ones relevant economic changes have taken place in the last few decades, which fact perfectly reflects that is a current issue nowadays. As a result of the above mentioned processes rural areas must face new challenges which have definitely affected the functions of such areas. It can be concluded that the generally revaluated social capital has special significance in reference to rural areas.
Revaluation of social capital is perfectly demonstrated by the rapidly and constantly growing amount of papers of social work in the field. This subject matter was mainly dealt with by sociology, but it has already become one of the most important issues targeted and examined by economics as well. Closely connected to the latter field, we cannot ignore spatial dimensions of social capital for which matter regional science also has responded. While I primarily focus on a special segment of space, in my work, I give a brief overview of the connection between social capital and spatiality by relying on and reviewing academic literature.

Keywords: social capital, spatiality, rural areas

INTRODUCTION

Physical and human capital together with an important element, social capital, makes up the assets owned by a community (BASILE-CECCHI, 2005). BASILE and CECCHI (2005) were led to the conclusion that capital, that comprises various parts, owned by a community (by individuals or by the community as a whole) contributes to the better understanding of the development level reached by the community itself. To put it another way, in economics, similarly to other social sciences, we cannot ignore the social dimension of capital in order to explain the performance shown by a community and the outcomes that the community expects.
When studying the interrelation between rural areas and society it is worth noting that the latter subject has a constantly growing rich and extended list of literary resources, especially on social capital – this is one of the most important multi-and interdisciplinary subject matters (KHAN ET AL, 2007). KHAN and his co-authors (2007) refer to a survey on 29 market economies which supports the idea of social capital's positive contribution to measurable economic performance. The latter conclusion is true especially for farms with low income.

SOCIAL CAPITAL

It is a less and less common view that capital merely represents infrastructure and machines used in the course of production. As a more valid approach, we could state that it is rather an abstract, non-market feature of high value - such as natural assets or factors of standard of living (SHAFFER ET AL, 2004).
LENGYEL (2012) describes that in economics human capital has gained importance besides technology. The author relies on LIN'S (2008) ideas which differentiate neocapital theories – concepts of human capital, cultural capital and social capital – from the classical Marxist concept of capital. Although a number of works are available on the subject of social capital,

no one and widely accepted definition of it has been formulated. As a Brook Lyndhurst paper (DEFRA 2010) mentions in an article, approaches in general share similar conceptual basis to Robert Putnam's definition. PUTNAM (1996) described social capital as "...features of social life – networks, norms and trust – that enable participants to act together more effectively to pursue shared objectives".

Certain strategies in the empirical study of social capital can be differentiated on the basis of the specific aspects considered (structural and cultural ones) and on the characterization of the assets (individual vs. collective property) (VAN DETH, 2008).

Closely connected to it, WESTLUND and ADAM (2010) state that building social capital has various purposes, depending on the participants and their preferences. In order to improve his/her social status, professional career or leisure an individual person can put effort into social relations. Economic aspects can be mentioned as a possible motive behind social capital investment for the individual, but at the same time social aspects are often of great importance, too. Different kinds of collective actors exist. Formal groups and organizations build social capitals on purpose as they aim at facilitating fulfilment of organizational objectives. This, in general terms, can be expressed as maximizing the utility of the organizations' members or owners. Another type of collective actor is a group without formal organization. Such groups are held together by geographical, ethnic or cultural factors. The basis for the creation of formal organizations that aim at representing the interests of the entire group is actually provided by feelings of solidarity in the group itself.

Other researchers emphasize the function of social capital on the one hand to enhance social cohesion, and on the other hand to consider the consequences of a lack of cooperation as inverse measures of social capital (VAN DETH, 2008). In that approach, van Deth refers to an OECD (2001) study according to which, for instance, crime rates or low levels of economic growth are applied as indicators for the lack of social capital.

Furthermore, STIMSON ET AL (2001, p. 11) mention that factors of sustainable innovative development (SID) involve social capital, defined as something that „(...this condition) comprises interaction and communication between people, socioeconomic bonds, social support systems, business networks (formal and informal), relations based on trust, and so on".

SOCIAL CAPITAL AND SPACE

According to RUTTEN ET AL (2010) social capital has been integrated into people's social relationships, and as social relationships have spatial dimensions so does social capital. But at the same time the fact cannot be ignored that no relevant stress was put on spatiality of social capital in academic literature for a long time. As WIESINGER (2007) notes it was RIFKIN (2001) who integrated spatial approach of social capital in scientific discourse.

Regional studies have also given space for the emergence of approaches regarding different types of capital, and as LENGYEL (2012) mentions, besides others, social capital plays an important role among the factors affecting regional competitiveness.

Connection between territorial capital and spatiality is examined by WESTLUND and ADAM (2010), too. They review 65 empirical studies, and the conclusion was drawn that, however, as regions and smaller spatial units are parts of nations, their conditions deviate from nations in certain respects and so do potential data sources.

Diminishing regional differences between economic development and providing the necessary conditions to enhance economic growth of less developed regions used to be the primary aims of regional development. As opposed to this, today more emphasis is put on preferring regions' individual advance, and it has been realised that not only the presence of

economic conditions is needed, but also a change in social values – a considerably slow process – is a must (LENGYEL, 2012). LENGYEL (2012) also adds there seems to be a general consensus on that development is not an automatic and linear process, centre-periphery relations may be reproduced because of global competition. On a long term basis, human and social capital seem to be the most important factors determining culture and institutions.
As LENGYEL (2012) notes human capital is characterized by strong rivalry while in the case of social capital cooperation emerges. Furthermore, social capital appears as competitive advantage of regions, though its measurement methodology is only in an experimental phase, it is not elaborated.
Closely connected to the above issue, more frequent critiques has been levelled against GDP and the role it plays in value measurement, to what extent it truly reflects welfare. One of such critiques in the form of a study has been articulated by STIGLITZ ET AL (2009), in which the authors deal with gross national products and review the above mentioned anomalies in detail. Besides others, this study has a significant statement, that is, complex things are measurable only by a set of complex indicators in the absence of which even professionals with the best intentions are unable to set economy on the right path.
In connection with spatiality of social capital RUTTEN ET AL (2010) assert that a crucial factor contributing to explaining the spatial distribution of social capital is thus the spatial distribution of people. Participants' contacts with each other usually spatially concentrate to the functional regions where they live or work in. However, a number of reasons could be mentioned for that the spatial distribution and extension of peoples' networks varies in durability, quality (transmission capacity of the links) and density (number of links per node).
RUTTEN ET AL (2010) also add that the various answers to the spatial dimension of social capital seem to indicate the existence of several different mechanisms at work. Moreover, there may be different forms of social capital depending on the type of relation and the social interaction that takes place within that relation. As a result, these different forms of social capital, in turn, may have different spatial dimensions.
This is why rural areas, as in many other fields, differ from urban areas.

SOCIAL CAPITAL AND RURAL SPACE

It needs to be noted that preserving environmental values and developing social capital is crucial as, if capital accumulates on the basis of market forces, then it will be concentrated in industrial centres instead of rural areas (KAHN-RIVAS, 2009).
When identifying a rural community, as DEL CID (2011) quotes BRENES'S (2007) approach, the following features can be detected: own behaviours, strongly attached to the place, mainly economic logic tied to subsistence or survival; life in the countryside, farming, livestock and fishing settlements scattered low density; distinct culture of the people of the city, matched with a greater sense of solidarity and friendship.
It is also evident that the existence of social networks, solidarity and cooperation enhance the efficiency and productivity of markets, and contribute to the improvement of institutional performance, ultimately resulting in higher economic and social development (NANETTI ET AL, 2011). ÁRNASON ET AL. (2004) agree with the above statement: they study and write about the concept of social capital in the context of rural development. Also, they argue that the performance, competitiveness and social cohesion of a community may be affected by social capital. In connection with Árnason's idea, WIESINGER (2007) notes that networks can be defined as highlighting the flows of resources and information that produce rural development and society more generally.

There is one special case which is worth mentioning and is not at all a general phenomenon, as ROSENFELD (2009) describes that although some researchers approach "rural clusters" expression as a combination of contrary notions, those do exist in a great number.
ROSENFELD (2003/A) mentions the importance of social capital, in relation to which he points out the role of clusters that provide space for information flow, affect economic possibilities, innovation projects and employment. Researchers often find that it is the absence or presence of social capital which determines the difference between „underachievers" and „overachievers" clusters' competitiveness (ROSENFELD, 2003/B). Those regions and individuals who are not able to benefit from the above clusters of social capital, suffer disadvantages in all economies, especially in knowledge-based economy (ROSENFELD, 2003/A).
Furthermore, DEBERTIN (2009) explains that economists might see per capita expenditures on items such as police protection in a rural community as a "negative" measure indicating the absence of social capital. In many small rural communities, people don't normally take safety measures such as locking their doors and no paid police force operate. A reason for this could be a function of the small community size in which everyone knows one other.
If we examine place (DEFRA, 2011), it can be concluded researchers generally agree on that, for whatever reasons, some elements of social capital are locally contingent. Place, with all its ramifications in terms of morphology, history, socio-demographic characteristics and so on, does represent a crucial factor in terms of how people experience social capital. However, it is not at all easy to provide a simple answer to the question of the extent to which social capital is found in people or place. It seems likely to be found in both, in a reflexive and unpredictable relationship.
According to COLEMAN (1988), tied to certain conditions, social capital might generate and enhance economic benefit. KAHN ET AL (2007) also serve with a number of examples for social capital's facilitating rural development.
Furthermore, it has to be taken into consideration that social capital – particularly in its form as institution or norms – needs to be fit both to the special circumstance and to the type of collective-action problem that it is meant to resolve (OSTROM, 2009).
In addition, it needs to be noted (DEFRA, 2011) that it is not easy to determine social capital in relation to development and intervention as it is often obscure and most of its elements are rather subjective than objective.

CONCLUSIONS

In my work, I examined the connection between social capital and spatiality, putting more emphasis especially on rural areas. I gave an overview of the theoretical background of social capital and its present role by reviewing and relying on academic literature. In relation to this, it can be asserted that a subject matter so popular and profoundly studied in sociology has become one of the most important issues targeted and examined by economics. As human relations inherently possess spatial dimensions, regional science also responded to the increasing interest in the matter.
Depending on individual actors and their objectives, the formation of social capital itself may be led by a number of intentions. In addition, many elements of social capital are strongly affected by location, thus it has a regional aspect as well. Furthermore, it may be able to enhance regional competitiveness.
In regard to spatiality, rural areas are considered to be unique from social capital's point of view. Though it is not an exclusive, general truth, it can be set out that in the many cases 'people friendlier, more humanistic' rural areas provide favourable conditions for building

human relationships. This way, rural areas can have a positive effect both on individual and community or rather network relations. This is of great importance as cooperation is a characteristic factor in the case of social capital – which is not true for other values. The main reason why social capital is said to be significant when talking about rural areas is that if capital accumulates on the basis of market forces, then it will be concentrated in industrial centres instead of rural areas. Thus social capital, due to it its kind, can be especially useful for rural areas, and it may as well appear in certain economic benefits. Social capital has the ability to affect capacity, competitiveness and social cohesion which means it may play a key role in rural development as well. However, making any attempt to intervene is by no means easy since social capital, by its nature, is highly dependent on the given space and comprises many subjective elements.

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A MANIFESTATION OF LANGUAGE POLICY IN HUNGARY – THE BILINGUAL EDUCATION OF MINORITY LANGUAGE SPEAKERS

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ABSTRACT
The present study focuses on the aspect bilingual education in Hungary when bilingual schools use one of the minority languages for teaching. The bilingual education for students whose native language is different from the majority language of the country is essential for the equal chance of academic achievement but for the better career perspectives majority language development has an equal importance. Therefore, bilingual schools are necessary for those students who live in an ethnic minority group in the country. Though most minority groups have chance to attend bilingual education, many, especially one of the largest minority groups in Hungary, the Gypsy population have access only to language lessons as a counterpart of monolingual education that does not provide the same chances of academic success and the preservation of native language and culture. This study gives an insight of the availability of bilingual schools for the minority language speaker students both in respect of languages involved and their location and investigate how the presence of bilingual schools correspond to the educational needs of minority groups.

Keywords: minority, ethnic groups, language politics, bilingual education, native language

INTRODUCTION

Bilingual education in terms of minority language involvement as one of the languages in teaching is part of the language policy manifestation in a country. Language politics in Hungary has very diverse realization in the minority bilingual education. According to the Declaration of Human Rights all people have the right to education, however the right to native language education is not explicitly involved (KONTRA, 2010) There were attempts to enforce the Native Language Human Rights (SKUTNABB-KANGAS, 1997) according to which all students taking part in education would have the right to receive it in their native language, however this declaration is still not in force (KONTRA, 2010).

Bilingual education has different levels according to the strength of native language use and it was well demonstrated by MAY (1997) and CHRISTIAN (1994), though in the present study the focus is on the presence of Hungarian bilingual education instead of the type it provides. In many countries the bilingual education and its effect on academic performance is one of the most popular educational research topics (LESZNYÁK, 1996), especially in the United States where minority language speakers live together and receive education together with majority language speakers. In Hungary the bilingual education is also getting into the center of educational research attention (LESZNYÁK, 1996). ISTVÁN KEMÉNY (1996) investigated the effects of the lack of bilingual education for the Gypsy students in Hungary as it is reflected in the dropout and unemployment rates. The data of the census of 2001 processed by TÓTH (2004) from the perspective of ethnic minority group presence is used in this study to see their proportion.

My aim with the present study is to shortly discuss the importance of native language education and to provide an overview of how the Hungarian bilingual schools reflect the educational need of ethnic minority groups in the country.

MATERIAL AND METHODS

For the present study data of the 2001 census was used to elaborate the proportion and locality of ethnic minority groups in Hungary as the 2011 census data is not fully processed at present. Internet database of the minority ombudsman was used as complimentary database for the location and language learning possibilities of minorities and report on bilingual schools from the national and ethnic minority rights parliamentary representative was used to gather information about ethnic bilingual schools and the education they provide (http://www.kisebbsegiombudsman.hu/data/files/217986220.pdf). To analyze the ethnic minority groups and the presence of bilingual schools data were collected from the internet (http://w3.kir.hu/intezmenylista2/lista.asp?lst_id=28&kat=17).

RESULTS

The importance of native language education

From the viewpoint of ethnicity as mother tongue the language that a person learns as his or her first language at home and the one the person assimilates with is regarded (KÁLLAI, 2011). The primary reason for bilingual education was well articulated by KRASHEN (1997): 'when schools provide children quality education in their primary language, they give them two things: knowledge and literacy.' The fact that minority speaker students cannot even start the education in their native language is parallel with the academic achievement and the educational level that determines their life possibilities. For this reason, bilingual education has a special importance in the earlier stages of education as primary or even nursery school level. The right to minority language education is one of the most important components of the cultural autonomy of minorities (MÁRKUS, 2007). For bilingual children whose first language is a minority language differing from the majority language, the monolingual school imposes extra learning difficulties sometimes in a degree that it places students in a disadvantageous situation depriving them from the possibility of the equal academic achievement and thus better career prospects in the future.

According to the studies of SKUTNABB-KANGAS (1997) bilingual education enhances academic achievement in school. For the successful education of minority language speakers the term 'bilingual' is crucial: though it is students' native language that helps them in understanding and learning the material to be acquired in school especially in the early stages of education, without the proper majority language competence they would have little chance for workplaces or career building in their adult life. (KONTRA, 2010) Therefore, native language education must always come together with majority language learning for an equal chance in school and working life. The UNESCO also recognized this necessity thus asserted that' the best teaching language is a child's mother tongue' (BIANCO, 1997).

There are different degrees in incorporating native language in bilingual education. According to the definition in SKUTNABB-KANGAS (1997), bilingual education is 'the use of two languages as media of instruction in subjects other than the languages themselves'. MAY (1997) makes this definition more precise by stating 'bilingual education involves instruction in two languages' to deliver the curricula content and not simply taught as a subject itself. Bilingual education can have a 'weak form' and a 'strong form'. The aim of the weak form is the strong dominance of the majority language (SKUTNABB-KANGAS, 1997). However, the strong form includes 'mother-tongue maintenance or language shelter programs, two-way bilingual (dual language) programs and plural multi-lingual programs.' It is important to

highlight MAY'S (1997) assertion that not the language itself is taught in schools as a second language can be regarded as bilingual education.

Ethnic groups with minority languages in Hungary

In the beginning of the 21st century about the 10% of the Hungarian population belong to a national or ethnical minority group, most of them still preserving and speaking their original native language. It is important to point out that during the census of 2001 only 3% of the population declared themselves as part of a minority group, expert say that the real rate is about 8-10% of the population (TÓTH ET AL., 2004).
In the sense of this law, Bulgarian, Gypsy, Greek, Romanian, Rusyn, Serbian, Slovakian, Slovenian Croatian and Ukrainian are officially resident minority groups in Hungary. Their geographical location is sporadic; they live in about 1500 settlements and usually form a minority group within the settlement.
In the first *Table* the number of ethnic groups living in Hungary is presented as recorded in the census of 2001. It is important to point out that the data was recorded acknowledging the fact that 95-96% of the population gave evaluate answer to the questions of ethnic belonging. Altogether 4.34 % of the population taking part in the census indicated the belonging to the 13 listed ethnic groups.

Table 1. The number of ethnic groups living in Hungary

Minority group	persons	% of the population	% of the minorities
Bulgarian	2316	0.02	0.52
Gypsy	205720	2.02	46.47
Greek	6619	0.06	1.50
Croatian	25730	0.25	5.81
Polish	5144	0.05	1.16
German	120344	1.18	27.18
Armenian	1165	0.01	0.26
Romanian	14781	0.14	3.34
Rusyn	2079	0.02	0.47
Serbian	7350	0.07	1.66
Slovakian	39266	0.39	8.87
Slovenian	4832	0.05	1.09
Ukrainian	7393	0.07	1.67
All	**442739**	**4.34**	**100.00**

Source: (TÓTH; 2004).

From all the 13 groups of minorities 71% declared themselves to belong to the minority group, however only slightly more than 30% declared the minority language as their first language. It is important to point out that 2/3 of those minority group members who were born abroad originally declared themselves belonging to the group by their native language. For instance, 92% of the foreign-born Bulgarians, more than 90% of the Polish, 81% of the Greek speak their native language as their first language, while in case of those born in Hungary this rate is 30%, 21% and 16%. This phenomenon is similar to the United States where first generation immigrants primarily speak the minority language.
In *Table 2* the rate of minority language speakers among the foreign-born and Hungarian-born minority population is shown.

Table 2. The rate of minority language speakers among the foreign-born and Hungarian-born minority population

	minority altogether	first language speaker altogether	%	foreign born	foreign born first language speaker	%	Hungarian born	Hungarian born first language speaker	%
Bulgarian	2316	1299	56.09	977	895	91.61	1339	404	30.17
Gypsy	205720	48438	23.55	932	439	47.10	204788	47999	23.44
Greek	6619	1921	29.02	1290	1047	81.16	5329	874	16.40
Croatian	25730	14326	55.68	2050	1154	56.29	23680	13172	55.63
Polish	5144	2580	50.16	2162	1955	90.43	2982	625	20.96
German	120344	33774	28.06	9756	6817	69.87	110588	26957	24.38
Armenian	1165	294	25.24	366	213	58.20	799	81	10.14
Romanian	14781	8482	57.38	7286	3912	53.69	7495	4570	60.97
Rusyn	2079	1113	53.54	1142	829	72.59	937	284	30.31
Serbian	7350	3388	46.10	2808	1395	49.68	4542	1993	43.88
Slovakian	39266	11817	30.09	2360	1130	47.88	36906	10687	28.96
Slovenian	4832	3180	65.81	307	139	45.28	4525	3041	67.20
Ukrainian	7393	4885	66.08	3668	2503	68.24	3725	2382	63.95
All	**442739**	**135497**	**30.60**	**35104**	**22428**	**63.89**	**407635**	**113069**	**27.74**

Source: (TÓTH; 2004).

Minorities' presence territory is the highest in Baranya County above 10% with about half of them being German, one quarter Gypsy ethnic group. In six counties the number of minorities is above 5%: in Szabolcs-Szatmár Bereg County 92%, in Borsod-Abaúj-Zemplén County 87%, in Nógrád County 67% of the minority population is Gypsy. In Tolna County the two-third of the minority population, in Komárom-Esztergom County half of the population is German, while in Békés County 42% is Slovakian, 23% Gypsy and 21% is Romanian. As it can be seen there are remarkable differences in the distribution of the ethnic minorities in the country. The Polish population in Hungary is mainly concentrated in Pest County and in settlements near Miskolc; the Croatian minority presence is high for instance, in Baranya County while Slovenians mainly live in the Őrség area near the Slovenian border. Bulgarians are present mainly in the area of Budapest, Miskolc and Szeged.

Bilingual education institutions in Hungary that involve minority languages

Ideally, the location and number of bilingual schools where one of the languages is a minority language should reflect the territorial distribution of the minority children. As it was previously mentioned there are different degrees in bilingual education. In this study, however, only the presence of bilingual education is registered regardless to the form it provides.

In Hungary the following bilingual schools provide minority language education to students from nursery to secondary school level: Croatian Nursery, Primary School and Grammar School and Hostel (Budapest), Hriszto Botev Bulgarian-Hungarian Primary and Grammar School (Budapest), Hungarian-Chinese Bilingual Primary School (Budapest), Koch Valéria Hungarian-German Secondary and Primary School, Nursery and Holstel (Pécs), Miroslav Krleža Croatian Nursery, Primary and Secondary School and Hostel (Pécs), General Culture Center of the German Living in Hungary (Baja), Croatian Language Education Nursery, Primary School and Hostel (Hercegszántó), Primary School and Nursery teaching in Beas (Gypsy) and Hungarian languages (Magyarmecske), N. Bălcescu Romanian Grammar School and Primary School and Hostel (Gyula), Kocsis József Bilingual Primary School and Nursery (Felsőszölnök, Slovenian-Hungarian), Slovakian Primary and Grammar School and Hostel in Békéscsaba, Tolnai Lajos German Ethnic and Bilingual Secondary and Grammar School and

Hostel (Gyönk), Baross Gábor Regional Primary Bilingual and Basic Art School offering Polish-Hungarian education (Parasznya)

Those minorities, who do not have bilingual education program, though are provided an education form where they can at least learn their language. In spite of the Greek minority presence, Greek language is not taught in bilingual education form, only taught as language in Zuglói Hajós Alfréd Hungarian-German Bilingual Primary School (Budapest), similarly to the Rusyn in Komlóskai Ruthenian Ethnic General Culture Center (Komlóska), Polish in Budapest is also taught as a language in National Polish Language Teaching School, Armenian have the possibility to take part in language classes in Budapest, Szeged, Székesfehérvár, Győr and Debrecen. There are Sunday schools for the Ukrainian minority students in Budapest, Szeged, Komárom and Várpalota.

Considering the fact that Békés County has the largest Slovakian and Romanian minority population the location of the two bilingual schools well reflects the needs. In Baranya County and Tolna County the rate of German minority is high, thus the Hungarian-German Bilingual School are also favorably located. In case of the bilingual schools, they are primarily situated in areas with the highest percentage of the minority population and most of them function as student hostel as well thus catering for the need of the students who want to participate in the bilingual education from further locations. It can also be concluded that majority of the bilingual schools offer education from the very early ages: nursery and primary school and some of them provide education on secondary level, too. The Polish population is mainly centered in Pest County and around Miskolc and in Parasznya, near Miskolc bilingual education is offered on primary level. The Croatian minority presence is high for instance, in Baranya County, where Pécs provides bilingual education. Slovenians mainly live in the Őrség area where Felsőszölnök has bilingual school. Bulgarians are mainly present in the area of Budapest, Miskolc, Szeged and can take part in native language education is Budapest. Serbians though do not have bilingual schools, they are provided with full Serbian language education at Nicola Tesla Serbian Language Nursery, Primary and Grammar School and Hostel in Budapest.

However, a deficiency in bilingual education becomes overt upon examining the ethnic languages involved : though there is a high rate of Gypsy population (whose first language is not unified, but can be either Lovari or Beas, for instance), their possibilities of receiving education in both their mother tongue and the majority language is lagging behind any other ethnic minorities. Though schools are operated for Gypsy students (Hunyadi János Primary, Secondary and Grammar School and Hostel in Jánoshalma with Gypsy ethnic education teaching Lovari language, Szent József Catholic Primary School Kiskunhalas Gypsy education without Gypsy language teaching Kodolányi János Secondary, Vocational Training and Primary School and Nursery in Bogádmindszent offering Gypsy education without language) they either do not provide bilingual education or teach a Gypsy language within the framework of language lesson that, as May asserts it, cannot be regarded as bilingual education.

In Hungary a great proportion of ethnic minority is formed by the Gypsy population with a first language distinct from the majority language and hardly any chance to bilingual education. According to ISTVÁN KEMÉNY'S study (1996) the dropout rate among Hungarian speaker Gypsy students below 8 grades is 22.9%, among Romanian speakers 41.6% and 48.2% among those Gypsies whose first language is one of the Gypsy languages. It is concluded that the high unemployment rate among the Gypsy population is due to the educational language 'discrimination' (KONTRA; 2010).

CONCLUSIONS

It can be concluded that in Hungary most ethnic minority groups with a native language different from the majority language have the chance to take part in bilingual education in their own language and the majority language thus they are able to preserve their own language as part of their culture, have equal chance in achieving academic success and at the same time master the majority language for better career possibilities later in life. The majority of these schools provide the bilingual training at the early stages of education when it is the most crucial for students to study in a language they understand the most. However, one of the biggest minority group, the Gypsies are hardly provided with the equal chances of bilingual education as other ethnic minority groups that can affect the dropout rates and the lack of academic success thus stabilizing or even increasing the unemployment rate of the group.

Among the thirteen ethnicities in the census of 2001 eight have the possibility for bilingual education; however the Chinese who were not listed at that time also have bilingual schools. Other minorities are not represented in bilingual education programs. Ethnic groups like Ruthenian, Serbian, Armenian or Greek can learn their first language only within the framework of language lesson at school or at culture centers as a result of local initiatives.

In Hungary, though bilingual schools in general cater for the educational needs of most ethnic minority groups, it would be useful to extend them to other minority languages to provide their children with the possibility of maintaining their language and achieve success in the society in which they live.

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TRANSFORMATION HOBBY GARDENS RESIDENTIAL AREA IN HÓDMEZŐVÁSÁRHELY

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ABSTRACT

By the administrative area of Hódmezővásárhely we are supposed to mean not only the inner part of the town but also the vast world of farmsteads together with it.

Fate of the former farmsteads of Kishomok on the two sides of the main road 47 between Hódmezővásárhely and Szeged has been formed differently as compared to the farmsteads in other parts of the town. As the area could not be cultivated on a large scale, due to its natural conditions, it was divided into plots and formed into closed gardens in the 1960s.

In the gardens around the farmsteads the former owners grew grapes and fruit until these places were transformed into gardens for resting purposes. In the 1970s small sheds and then weekend-houses were built on the plots.

In the 1980s the population started to move into this area which is resulted from decentralization, so the first permanent inhabitants settled down in the closed gardens of Kishomok that time. This process can be explained primarily with social reasons.

One of the most outstanding elements of the Hungarian suburbanization was the spatial reorganization of the population. The same thing happened in Hódmezővásárhely, too. For the last 20 years it has been Kishomok where the infrastructural development could be experienced the most, comparing to certain parts of the Town. By today the former world of farmsteads has been transformed into an independent district.

INTRODUCTION

On the basis of the data from 1 January, 2010, 1149 people live in Kishomok, which is now a district of Hódmezővásárhely (data from the registry of addresses Hódmezővásárhely). This part of the town underwent a huge change in the last ten years, the former farmsteads and especially the cottages, gardens have formed into a suburbia area by today. A particular form of suburbanization can be observed here which I am planning to show.

At first I introduce geographical location and history of area called Kishomok. The main road 47 divides Kishomok into two parts: the so-called Öreg-Kishomok, which is a bit away from the town and Új-Kishomok, which can be seen as continuation of the town. *(Map 1)*

Map 1. Real image map of Hódmezővásárhely
Source: (CSÁKI, 1977)

The relatively vast wavy ridge, by the road to Szeged, evolved from the bed of the lake Hód, which was in the former flood area of the Tisza, in called hydroeolic way. Its height above the sea level is 77-88 metres. (ANDÓ, 1984) Before the Tisza had been regulated, at time of bigger flooding the higher parts remained dry thus making grape and fruit production possible. Some maps suggest that there had been contiguous vineyards in the 1780s. After the regulation of the Tisza it partially started to be transformed into a summer resort along with the construction of the road to Szeged (today, motorway 47) and railway. (BODNÁR, 1983) It began in 1905 when Countess Károlyi, Pálffy Geraldina divided the family property into gardens of 1.936 square meters which were then bought by the inhabitants of Vásárhely. The area was called Bercsényi Colony (today, Öreg-Kishomok) from the 1920s.

There were fruit-gardens just south of the town which spread to the banks of the Tisza, in the direction of the railway bridge at Algyő. The owners planted pear, apple, plum, cherry and nut-trees and hazel-groves. Gardens and fields alternated with each other.

Besides summer houses, vine-yards and fruit-gardens were planted where the former owners produced for the capital markets; the area had its own fruit-packing plant in the building of today's „Anno" restaurant *(Picture 1)*. (KÖRTVÉLYESSY, 1971) In these years there were 10-12 farmsteads in the area, while the others worked as gardens where the owners, who lived in the town, built only a shed. Later a part of the vineyards was cut down, and the sand was exploited for the construction works (BODNÁR, 1983). The area of the former sand-pit has been built in by today, only a deep slope shows its place.

After the World War II the trees were cut down in the framework of collectivization, while instead of the former owners, the Lenin and Rákóczi Co-operative Farms, which have gone into liquidation, cultivated the fields.

1.a *1.b*

Picture 1. The „Anno" restaurant in the past (1.a) and now (1.b)
Source: (Private collection, and author's photo)

Today's Új-Kishomok evolved from the former Kishomok-halom and Szöllő-halom on the other side of the main road 47, west of the railway between Szeged and Szentes. According to some records the two „halom" („hillock") are the same but the name „Kishomok" is more wide-spread. There are only a few farmsteads here, in this part. Új-Kishomok is located closer to „Kertváros" -another district of the town-, practically it is the continuation of the latter one (BODNÁR, 1983).

MATERIAL AND METHOD

In my research I used articles on the urbanization of Hódmezővásárhely and the news from the local newspaper, besides the specialized literature on suburbanization. Also, I met some older and new inhabitants of Kishomok, coordinators, the leader of the reading circle, the representative whom I made interviews with. By examining the photos, given to me, sales contracts from the last centuries and other archive materials, I managed to reconstruct how Öreg and Új-Kishomok were formed. I got valuable answers from the experts of the Engineering Office of the town I would like to thank for now. During my work I visited the district several times taking photos and making descriptions, and also I participated in the programs organized in Kishomok.

RESULTS

From farmsteads and hobby gardens to district and village-like zone

A particular process of suburbanization can be observed around Hódmezővásárhely-Kishomok which I am aiming to describe briefly. Its essence is that the inhabitants moved from the town to the surrounding areas where the basic elements of the infrastructure were provided for them. Hódmezővásárhely, like other Hungarian towns, differs from the general suburbanization process of cities in the fact that, while in other cases even economic activities might appear in the rural area, moving out and the settlement of the population can be experienced as a typical process (BAJMÓCZY, 2001).

In the area of Kishomok the number of permanently inhabited farmsteads was low, while the number of weekend-gardens is relatively high. Since it was difficult to cultivate the area on a large scale, from the 1960s both Öreg and Új-Kishomok were divided into closed gardens. As a result, about 700 plots were sold the owners of which lived in Vásárhely having their own flats. Kishomok became a new zone of the town with hobby-gardens, as a suburban agricultural area. According to the regulations of the Country's Architectural Rule, in the 1960s only smaller territories could be built in, later the size of these areas increased. It meant

that while in the beginning only sheds were allowed to be built, then a toilet or a shower next to the shed which later „moved" into the house itself. A subsequent direction allowed to construct a bigger building on plots the topographical number of which began with „0". This house made a more comfortable recreation possible for the owners. (Oral information from the Engineering Office of Hódmezővásárhely)

A similar process can be seen around several towns of the Hungarian Plain in the 1970s, like- for example- in the nearest city, Szeged. (TÍMÁR, 2005)

Animal husbandry and cultivation of plants, typical to the old farmsteads, were specific to Öreg-Kishomok on a lower scale however, it is not typical to Új-Kishomok. They cultivated the area for their own needs, or perhaps they sold their crops in the local market (SZENTI, 2007).

A new district on the town map

On the basis of the „tetrahedron model" created by TÓTH JÓZSEF, by the beginning of the 1990s everything had been provided to make Kishomok a small settlement, a new district (TÓTH, 1981). The natural conditions were favorable, also it is close to the main road 47, which made possible to reach either Hódmezővásárhely or Szeged more easily and quickly. Moreover, it became more difficult for some families living in the blocks of flats to make ends meet there, since they could not or could hardly pay their bank loans. As a result, they decided to move to Kishomok. That time the basic infrastructural elements (drinking water, electricity and road) had been provided, and more and more property owners intended to make their plots in Kishomok permanent dwellings. This interest and need increased even more after the political changes, at the beginning of the 1990s. Demand for the comfortable life from both the permanent inhabitants of Kishomok and the owners of „second houses" resulted in more infrastructural development in this area. Becsei says these types of farm are called holiday farm types (BECSEI, 2002).

The town's council had its own order according to which if the garden owners of Kishomok contribute to the infrastructural development with a determined sum, the town provides the remaining part. Besides, the council took charge of making the plans and then the implementation, as well (36/1995./10.05/KGY. SZ. order).

In Új-Kishomok the construction of the network of the technical infrastructure began with the water-conduit in 1996 which was followed by the gas distributing system in 1999. In September, 2000 after the basic public-utility services had been constructed, Új-Kishomok became the inner part of Hódmezővásárhely, as a continuation of the district Kertváros. It is estimated that the plot prices has increased ten times as compared to the ones in the 1980s. More and more areas join the inner town so more and more people ask for and get permissions to build houses. According to the data of the Town's Registry 756 people lived in Kishomok on 1 January, 2010. Regarding the age composition of the inhabitants mostly young families with small children live there. However, it is important to mention that there are still lots of hobby-gardens and weekend houses where the number of older owners is relatively high *(Picture 2)*.

Picture 2: A street in Új-Kishomok
Source: (author's photo)

The interest towards the district has not decreased which is supported by the public lighting and the surfaced road which can be reached both from the main road 47 and the centre of Hódmezővásárhely.

Construction of the water-conduit and the gas distributing system was carried out later (at the end of September, 2003) in Öreg-Kishomok. The roadbed was finished in 2004 followed by the surfaced road and public lighting. It became a residential area in 2006.

Development of Öreg-Kishomok differs from Új-Kishomok in some respects. Új-Kishomok is a suburbia zone, while Öreg-Kishomok is a village-like area. According to today's town development plan the whole area of Kishomok is regarded as a village-like residential zone, according to Mendöl's literature (MENDÖL, 1963).

There are approximately 600 hobby-gardens in Öreg-Kishomok, out of which 160 are permanently inhabited, the others are only gardens. Their number is constantly changing since certain gardens are drawn together, while others are divided and then sold. On the basis of data from 1 January, 2010, it has 393 permanent inhabitants whose age is higher than in Új-Kishomok, so is the number of people who live alone (130-140 live in families, the others are single). The rate of the younger population is increasing here, too. The older ones are replaced by younger families, though not by their own family members, but by those who are newcomers in this area. (Data from the registry of Hódmezővásárhely)

More people grow vegetables and fruit for their own use in Öreg-Kishomok than in Új-Kishomok. The number of bigger farmsteads is 8 which is more than the one in Új-Kishomok. 4 farmsteads go in for floriculture; the others raise geese and pigs. Where there are cows, milk and cottage cheese are also produced and sold. In 2 farmsteads people grow mushrooms. (It is sourced on the basis of the oral information of coordinator in Öreg-Kishomok.)

The street network of Kishomok was formed together with the development of the infrastructure. Their names come from the names of the former ridges (Fári, Hegyi, Gólya, Szántó, Vajnai). There are 29 streets in Öreg-Kishomok and 33 in Új-Kishomok.

Both parts are represented; they organize their social life independently. The inhabitants organize „village days", carnivals, Santa Claus-evening – like any other districts. The Society of Garden Owners of Öreg-Kishomok was founded on 3 March, 2003. The Reading Circle of Kishomok gives home to the community programs in Új-Kishomok.

The Reading Circle works in a similar way to the reading circles in the former world of farmsteads. They have a community building where there is a small library; also a computer and internet access are available for the members. They are utilized mostly by the less wealthy families living in some farmsteads of Kishomok.

Strolling along the streets of Kishomok we can meet the garden owners, permanent

inhabitants, in both parts we can go into groceries or to the local pub to drink something.
I think the district, which consists of the former summer houses and farmsteads, lacks only three things: public transport, a church and a school.

CONCLUSIONS

Nowadays those who arrive from Szeged can have the view of a typical Hungarian town border: first, weekend-houses, then getting closer to the town: new detached houses, villas together with a few farmsteads. However, the farmsteads built here differ from the others, they resemble an old detached house which is fenced and which is adjusted to the neighboring plots. Only the carefully cultivated garden, the fruit-trees, some rows of vines, and the kitchen garden refer to the fact that they were farmsteads. On the other hand, in the plots of the inhabitants who moved here from the end of the 1980s the pleasure garden, garden trees and the well-mowed grass surround the detached houses.
The society of today's Kishomok has changed due to the moving out. Inhabitants of the old farms, houses have been replaced by the families who moved out of the town. In my research I realized a specific element of suburbanization: namely the power of social collaboration. Due to the initiatives of the „new" population in the last 20 years a new district and village-like zone could be formed on both sides of the main road 47.

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