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**Izlaganje sa znanstvenog skupa
Conference paper****QUADRILATERAL COLLABORATIONS IN THE FIELD OF
ANIMAL SCIENCE – OUTCOME AND FUTURE PROSPECTS****G. Milisits, C. Szabó, Melinda Kovács, J. Stefler****Summary**

In this paper authors reviewed the history of the International Symposium „Animal Science Days” from the beginning up to now. After showing the antecedents of this scientific meeting the places and topics of the former symposiums were demonstrated. After reviewing the development of this event in the last 18 years, collaborations based on the quadrilateral cooperation of the partner universities were demonstrated. As results of these scientific cooperations common publications and also the importance of collaboration in the field of education were evaluated. For further collaborations the fields of common interests and also the internationally available funding were demonstrated. Based on this review it was concluded that “Animal Science Days” symposium contributed significantly to the scientific and educational life of each partner university and the agriculture of the Alps-Adriatic region. The partner universities have further possibilities to extend their collaborations, but a joint lobby for creating new funding possibilities would be a great help for them.

Key words: quadrilateral countries, symposium, collaboration, animal science.

Antecedents, beginning of the collaboration

It is an old experience that successful cooperations are based on good private relations. It is the same in the case of the “Animal Science Days” international symposium too.

Initiative to start the symposium was launched at annually meeting of Croatian agronomist held in Pula in February 1993. The initiators of this regularly organized scientific meeting were Professors Slavko Čepin from University of Ljubljana, Ivan Jurić and Marija Đikić from University of Zagreb, Professor János Ember from University of Kaposvár and Gordana Kralik and Antun Petričević from University of Osijek. At the beginning of this cooperation, colleagues from the partner universities visited each other and exchanged their experiences in the field of animal production and husbandry in the context of adaption to EU regulations and competitiveness.

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The other mutual point was the horse sport. The horse-riders of the Adriatic region have become permanent participants of the international dressage tests, which were regularly organized in Kaposvár. The direct scientific research cooperation was started later in order to find solutions commonly for the different problems in animal husbandry. The most active research fields were the poultry, pig and cattle production.

Start of the „Animal science days” Symposium

– From this point on only one step was needed to organize the first common scientific conference (International Symposium „Animal Science Days”), which was organized in 1993 by the PANNON Agricultural University, Faculty of Animal Science, in Kaposvár, in Hungary. According to the agreement of the founder universities the following symposiums were organized in a circular system. The participating countries hosted the symposium every year in the following order: Hungary, Croatia, Slovenia. After Italy (representing by University of Padova, Faculty of Agriculture) joined to the collaboration, the symposium was organized in every fourth year in the same country.

The main topic of the symposium was chosen by the host country every year. As it is visible in *Table 1.*, very wide area of animal husbandry and animal production was discussed during the last 18 years.

The scientific program of the symposium always started with the plenary lectures of each country representatives in the frame of the main topic of the symposium. The further oral presentations were divided into different sections according to animal species or topic of the presentations. Next to the oral presentations also posters were always presented during the symposium.

The official language of the symposium was the language of the host country and German and English in the first 9 years. During this time simultaneous translation into English was always provided. In order to simplify the organization and to improve the level of the symposium the official language of the symposium was changed to English in 2002.

Table 1. Places and topics of „Animal Science Days” (ASD) symposiums

Serial number of ASD Symposium	Year	Place	Topic
1st	1993	Kaposvár (Hungary)	Qualification of animal products and possibilities of their quality improvement
2nd	1994	Rovinj (Croatia)	Research and practice in agriculture and food technology
3rd	1995	Bled (Slovenia)	Perspectives in the production of various kinds of meat
4th	1996	Kaposvár (Hungary)	Animal production, healthy nutrition, environment
5th	1997	Opatija (Croatia)	
6th	1998	Portorož (Slovenia)	Quality adjustment of animal production and products to the European Union standards
7th	1999	Balatonföldvár (Hungary)	The present situation and tasks to be accomplished in animal production prior to entry into the European Union
8th	2000	Osijek (Croatia)	Animal products and human health
9th	2001	Radenci (Slovenia)	Meat and milk production of the future
10th	2002	Pécs (Hungary)	Environment friendly and EU conform animal husbandry
11th	2003	Poreč (Croatia)	Competitiveness of livestock production during the process of the EU integration
12th	2004	Bled (Slovenia)	Animal production according to ecological, ethological and ethical norms
13th	2005	Padova (Italy)	Husbandry, food and environment. The new challenges of the animal science
14th	2006	Lillafüred (Hungary)	Future trends of research on food quality and safety
15th	2007	Osijek (Croatia)	Recent advances and future priorities of animal product quality in EU
16th	2008	Strunjan (Slovenia)	Sustainable Farm Animal Breeding
17th	2009	Abano Terme (Italy)	Priorities for the European animal production in a global market
18th	2010	Kaposvár (Hungary)	Possibilities and delimitations of extensive animal husbandry

Thanks to this change the discussions after the presentations were ever intensiver and therefore the professional importance of this symposium became also higher. From this time forth the symposium provided a very good opportunity for the PhD students to make oral presentations in English language and to take part more actively in the discussions.

Current situation

Because of the relative low number of participants (about 80 in every year) very good partnerships and friendships were evolved between the participants from different countries and universities. Based on these friendships and common interests many cooperations were started between the participating universities in the last years. In the field of research many experiments were carried out in the rabbit and poultry breeding in the cooperation of the Kaposvár and Padova universities. These experiments were mainly focused on the *in vivo* determination of body composition (Milisits et al., 1999) and later on animal welfare in rabbit breeding (Princz et al., 2008; Dalle Zotte et al., 2010; Szendrő and Dalle Zotte, 2011) and on the practical applicability of the *in vivo* determination of egg composition in poultry breeding (Dalle Zotte et al., 2011). These common projects have used the very good experimental infrastructure and *in vivo* egg and body composition analysis (by means of computer tomography) in Kaposvár and the high quality laboratory background for meat sample analysis in Padova.

The laboratory background of the Kaposvár University is often used in the cooperation with the Josip Juraj Strossmayer University in Osijek (Croatia). From the chemical analysis of different samples the determination of fat and fatty acid content of different meat samples was realized in common publications (Kralik et al., 2004, 2006).

In the field of the statistical data analysis cooperations are based on the knowledge of the colleagues at the University of Zagreb (Croatia). A lot of production data originated from Hungarian databases were analyzed with their help (Nagy et al., 2009, 2010). Some pedigree analyses and inbreeding examinations were also done in the frame of these cooperations (Farkas et al., 2007).

In the field of the genetic studies cooperations between Croatia and Slovenia were also observed (Potočnik et al., 2006, 2009).

The cooperation between Italy and Slovenia can be observed in the field of cattle breeding. The common research is focused on the study of feeding and social behaviour of fattening Cika young bulls.

In a trilateral cooperation between Croatia, Italy and Slovenia milk production is also represented as common research interest of the partner universities (Gantner et al., 2009a). Similar research works were done also in Croatian-Slovenian collaboration (Gantner et al., 2009b, 2010).

The possibility in the ERASMUS program and also in some other bilateral agreements is frequently used for exchange teachers and researchers among the participating universities. Colleagues are often invited to be a speaker at conferences or to give lectures for colleagues and/or students in specific topics at some of the partner universities.

Common publications

Due to the intensive cooperations between the participating universities a lot of common publications were appeared in different high quality scientific journals (*Acta Alimentaria, Annales de Zootechnie, Applied Animal Behaviour Science, Journal of Animal Science, Livestock Science, Meat Science, World Rabbit Science, etc.*), and in international conference proceedings (*World Rabbit Congress, International Congress of Meat Science and Technology, European Symposium on the Quality of Eggs and Egg Products, European Symposium on the Quality of Poultry Meat, etc.*). In Table 2. the number of common publications at the Animal Science Days Symposiums is summarized covering the 18 years history of this cooperation.

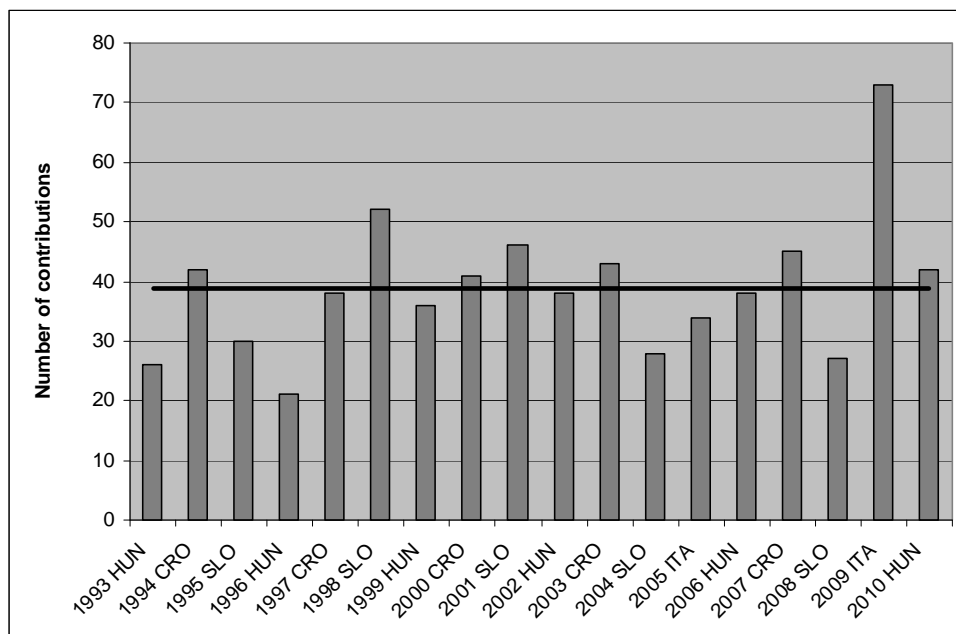
Table 2. The number of common publications at the Animal Science Days symposiums between 1993 and 2010 in different cooperations of the participating countries

Co-operation	Number of publications
Croatia – Hungary	4
Croatia – Italy	1
Croatia – Slovenia	17
Hungary – Italy	5
Hungary – Slovenia	-
Italy – Slovenia	-

From this table it is well visible that – due to the common historical background and very similar languages – the cooperation between Croatia and Slovenia was the most active. Some common papers were published also from the cooperations between Croatia and Hungary and Hungary and Italy, but the cooperation between Croatia and Italy, Hungary and Slovenia and Italy and Slovenia could be more active in the future.

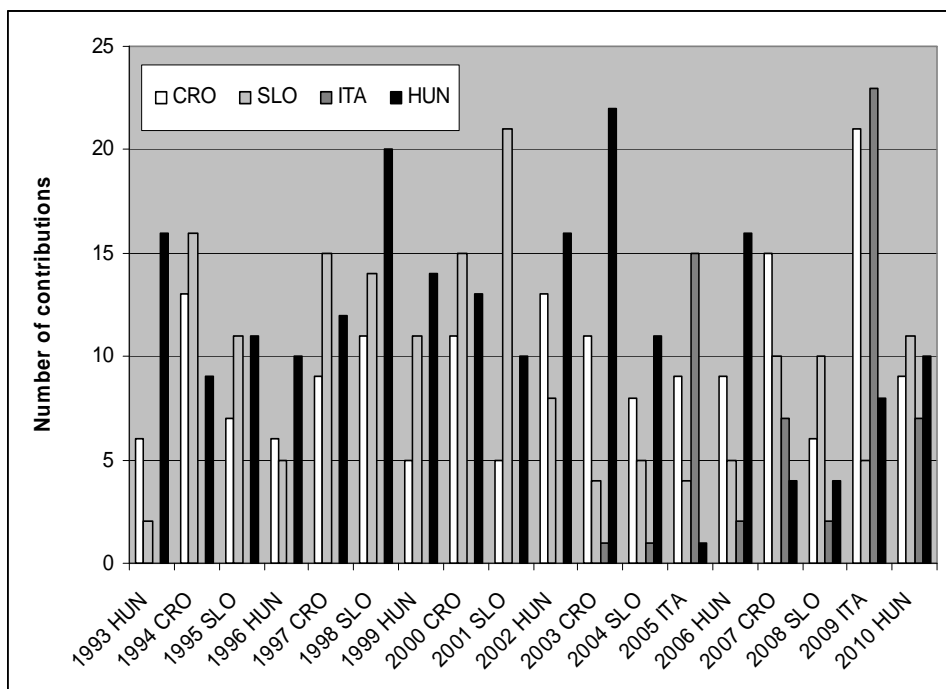
The average number of contributions – without presentations of the plenary sessions – was 38.9 at the ASD conferences in the last 18 years (*Figure 1*). The number of contributions was mainly between 30 and 50 irrespectively of the organizing country. In spite of the natural fluctuations around the mean value, even tendency can not be observed regarding to country preference ($P>0.05$). The lowest number of contributions (21) was presented in 1996, while the highest (73) in 2009.

Figure 1. Total number of contributions at the ASD conferences



The number of contributions grouped by the country origin of the presenting authors can be seen on *Figure 2*.

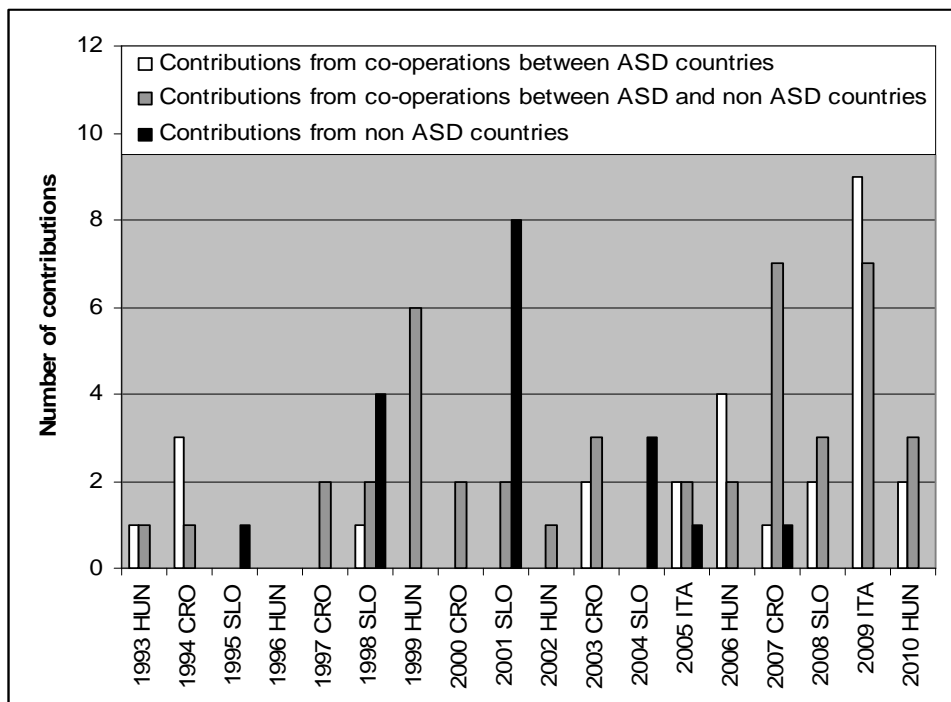
Figure 2. Number of contributions at the ASD conferences grouped by the country origin of the presenting authors



The average contributions were 9.7, 9.6, 7.3 and 11.5 for Croatia, Slovenia, Italy and Hungary, respectively. In the case of Hungary some decline was observed in the number of contributions in the last some years, which is caused by the less activity of researchers of the Faculty of Economics at the Kaposvár University.

On *Figure 3*, the numbers of contributions grouped by the origin of type of cooperations are demonstrated.

Figure 3. Number of contributions at the ASD conferences grouped by the origin of type of cooperations



On this figure it is well visible that contributors from the ASD countries regularly present their work jointly with researchers outside from the ASD countries. At the early stages of this symposium, researchers of the member countries only occasionally presented joint works, while this type of presentation became more regular in the last some years. However, it reaches only about 5-10% of the total number of the yearly contributions.

Foreign contributors just irregularly visit the ASD conferences. Slovenia seems to be the most active in the invitation of foreign presenters to this scientific meeting.

Importance of collaboration in the Msc and Phd courses

Thanks to these cooperations year by year more and more students can write their thesis work by using the results of these common experiments. It is also more frequent that students do their experiments (or a part of them) at another partner university and sometimes they write their work in English language.

Using the possibilities in the ERASMUS program students often go to a partner university either for semester long studies or just for short term courses in specific topics. For the more efficient utilization of this very good opportunity the increase of the number of courses in English language seems to be necessary almost at all of the participating universities.

In the different Doctoral Schools some students already write their dissertations from the results of the common research projects of the partner universities. In the future the possibility of common education and the creation of joint diploms could be considered too.

Future prospects

All universities in this quadrilateral collaboration hold a leading position in their country in agricultural science by the facilities, number and qualification of scientists, scientific projects and publications. Research activities cover several areas of interest for sustainable animal production, highlighting on genetic improvement and conservation of biodiversity, nutrition and feeding, welfare and management of livestock, safety and quality of animal products, aquaculture, wildlife biology and management. The research facilities, including infrastructure and human resources, are unique in certain areas and a complementary utilization could be offered.

For further joint research activities internationally available funding are needed. In Hungary the Hungarian Scientific Research Fund (OTKA)

supports mainly basic research, announces programmes for funding projects based on international cooperation. The joint application in English of the two or more research training groups should be submitted to the research funding organisation in their respective countries. The proposal will be supported by OTKA only if all participating funding organisation will support their own applicants.

Since Hungary joined the European Union cooperation possibilities have become wider, mostly operating under the principle that the coordinating body provides only the additional expenses necessitated by the cooperation. The European Science Foundation (ESF) managed EUROCORES projects, also acknowledged and subscribed by OTKA and the Hungarian Academy of Sciences (MTA) are examples for such cooperation.

The Division of Bilateral Affairs of the Hungarian Science and Technology Foundation maintain and develop bilateral international relations of the Hungarian R&D community. The Foundation has been executing the administrative and financial management of the projects approved under the bilateral intergovernmental S&T agreements, which Hungary has signed with more than 30 countries all over the world. Presently the Division handles and administers about 600 mobility and workshop projects annually.

INTERREG IVC provides funding for interregional cooperation across Europe. The areas of support are innovation and the knowledge economy, and environment and risk prevention. Typical tools for exchange of experience are networking activities such as thematic workshops, seminars, conferences, surveys, and study visits.

Taking the knowledge-maps of the individual institutions as a basis, a database could be created indicating both free capacities and demands for cooperation. Depending on the current proposal for cooperation, the appropriate funding can be selected.

Conclusions

Based on the reviewed collaborations it was concluded that “Animal Science Days” symposium contributed significantly to the scientific and educational life of each partner university and the agriculture of the Alps-Adriatic region. The partner universities have further possibilities to extend their collaborations, but a joint lobby for creating new funding possibilities would be a great help for them.

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SURADNJA IZMEĐU ZEMALJA KVADRILATERALE NA PODRUČJU STOČARSTVA – POČECI I PRESPEKTIVA

Sažetak

U ovom radu prikazana je povijest odvijanja međunarodnog znanstvenog simpozija „stočarski znanstveni dani” od njegovog početka do danas. Nakon prikaza samog početka ovog simpozija, pobrojana su mjesta i teme kojima su se bavili dasadašnji simpoziji. Također prikazana je suradnja između sveučilišta koja sudjeluju u organizaciji ovog simpozija. Kao rezultat te suradnje objavljan je velik broj zajedničkih publikacija te je naglašeno značenje suradnje u polju edukacije. Također su navedene područja moguće suradnje u budućnosti kao i mogućnosti korištenja međunarodnih izvora financiranja simpozija. Na osnovu ovog pregleda može se zaključiti da „stočarski znanstveni dani” daju značajan doprinos poboljšanju znanstvene i nastavne kvalitete na partnerskim sveučilištima kao i poljoprivredi uopće na području regije Alpe –adria. Partnerska sveučilišta imaju mogućnosti proširenja suradnje, ali je pri tome potrebno zajedničko lobiranje za dobivanje sredstava koja bi im pomogla u tome.

Ključne riječi: zemlje kvadrilaterale, simpozij, suradnja, animalne znanosti.

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