

Executive Summary:

The ANIMBIOGEN in EU project was realised by the Institute of Genetics and Animal Breeding of the Polish Academy of Sciences. The project's main objectives included: stimulating the realization of the full research potential of the Centre located in the UE convergence region by unlocking and developing its existing excellence in the fields of genomics and biotechnology for improvement of farm animals functional traits and high quality food obtained in sustainable production systems, with reference to animal welfare and a limited unfavourable effect of agriculture on the environment in Europe. It should help to strengthen and achieve the highest quality research capacity of the Centre (human and material potential, effective research management) to participate successfully in research activities at the European level. Another purpose was creation of a permanent regional research centre network and improving the Centre's position as a training centre in the fields of molecular genetics and animal biotechnology for professionals.

These objectives were achieved based on SWOT analysis by: exchange of know-how and experience by 65 bilateral visits, twinning, networking and two-way secondments of staff with strategic outstanding European partners, knowledge transfer through 7 international conferences, 2 workshops and 3 seminars, recruitment of 5 experienced researchers, wide promotion of the Centre, acquisition and development of laboratory equipment, intensive scientific cooperation with leading EU institutions and facilitating cooperation with SMEs.

The ANIMBIOGEN in EU project resulted in IGAB PAS participation in 8 joint grant proposals for new FP 7 projects out of which 2 already received funding, 4 proposals for international bilateral projects and 3 new projects realised with participation of SMEs with a total value for IGAB PAS of over 4.5 million euro. There were also reached 4 agreements on cooperation with foreign partners: Wageningen UR (the Netherlands), University of Teramo (Italy), University of Manchester (UK), Technical University of Munich (Germany). As a result of project activities there were published 11 scientific papers (further are under preparation).

The success of the ANIMBIOGEN in EU project being the first Polish project awarded in Research Potential theme of the FP7 shows that investment in Polish science is beneficial for the European society.

Project Context and Objectives:

The project was realised by the Institute of Genetics and Animal Breeding of the Polish Academy of Sciences, including five departments: Department of Animal Improvement, Department of Molecular Biology, Department of Experimental Embryology, Department of Animal Behaviour, Department of Animal Immunogenetics in order to provide interdisciplinary approach to solving research problems.

-ANIMBIOGEN in EU Centre of Excellence in Genomics, Biotechnology and Quality of Animal Products in Sustainable Production Systems with consideration of Animal Welfare project was aimed at removing development barriers which had been identified after the completion of the former project ANIMBIOGEN Centre of Excellence in Genomics and Biotechnology Improving Functional Traits of Farm Animals and Quality of their Products (2003-2006, FP 5), in order to strengthen the Centre excellence in its research areas.

The Centre is active in two main areas basic and applied research. The former included research on molecular genetics including functional genomics, experimental embryology and reproductive biotechnology, as well as animal behaviour.

The applied research is conducted in the fields of population genetics and animal breeding, aiming at elaboration of such methods of animal improvement and production, which rendered possible the production of safe and valuable food, simultaneously retaining a high level of animal welfare and a limited unfavourable effect of agriculture on the environment. One of the most important issues in altering animal products composition and quality to increase their health and nutritious through the selection of animals carrying the appropriate gene variants and the use of appropriate feeding regimens. The focus is also on improvement of quality of milk, meat and eggs obtained in sustainable production systems with special reference to bioactive components having positive effect on human health that is important in face of increasing risk of civilization diseases. The aspects of animal welfare in the production chain of different farm animals were very important, as well.

The project was based on a detailed SWOT analysis with a view to enhance and exploit the strengths and opportunities of the Centre and eliminate and suppress its weaknesses and threats in order to unlock and develop the long-term research potential of the Centre within its strategic research programme.

The project's main objectives included: stimulating the realization of the full research potential of the Centre located in the UE convergence region by unlocking and developing its existing excellence in the fields of genomics and biotechnology for improvement of farm animals functional traits and high quality food obtained in sustainable production systems, with reference to animal welfare and a limited unfavourable effect of agriculture on the environment in Europe. It should help to strengthen and achieve the highest quality research capacity of the Centre (human and material potential, effective research management) to participate successfully in research activities at the European level.

The project's specific objectives were connected with 6 milestones that were reached during the project and included:

- Improvement of quality and management of research;
- Increasing the number and training of research staff;

- The acquisition of research equipment;
- Improving the Centre's position as a training centre for molecular genetics and animal biotechnology professionals;
- Increase of a number and value of EU research grants;
- Increase of a number and value of projects with participation of SMEs and industry;
- Increase of a number of original papers published in recognized journals covered in JCR.

Regarding sustainable production systems, emphasis was mainly put on supporting the research potential for the improvement of food quality and a better understanding of threats to the sustainability and security of food production (high quality products from farm to fork), low-input and organic production systems. The focus was also on optimising animal health and welfare and improvement of understanding of animal physiology and behaviour.

According to the research programme, the project led to increased participation of the Centre in research in the following fields: functional genomics, animal production in conjunction with the exploitation of genetic knowledge, new breeding methods, basic and applied reproductive technologies, nutrigenomics, as well as the development of basic tools and technologies, including: transcriptomics, proteomics, metabolomics and bioinformatics.

Regarding biological resources connected with animal production, emphasis was put on enhancing the Centre activity in the areas of biological functions, as well as safe and environmentally friendly production systems.

Main impacts of the ANIMBIOGEN in EU project were connected to upgrading the capacity of research, technology and development activity of the Centre. They were fully achieved and included:

- Increase of a number and value of EU research grants and projects with participation of SMEs and industry connected with improvement of research management (8 projects in the years 2009-2012).
- Human potential, i.e. increasing the number and training of research staff (13 new employees; 9 new PhD degrees, 7 new DSc degrees, 2 new professor titles in the years 2009-2012).
- Material potential, i.e. the acquisition of research equipment (ICP-MS spectrophotometer, the microarray printer, the Pinnacle PCX postcolumn derivatization system and the gas chromatograph).
- Significant improvement of quality of research demonstrated, among others, by number of original papers published in recognized journals (201 papers in journals covered in JCR in the years 2009-2012).
- Increasing the impact factor of journal *Animal Science Papers and Reports* published by IGAB PAS due to strengthening the international cooperation (from 0.214 in 2009 to 0.553 in 2012).

These impacts were achieved, inter alia, through: training and improving skills of all research staff of the Centre through attending the series of 7 international conferences and 2 workshops organized by the Centre with participation of outstanding scientists from leading EU scientific institutions, as well as through bilateral exchange of research staff with recognized EU laboratories (65 visits) and

recruitment of 5 experienced researchers. The research infrastructure of the food quality improvement laboratory and functional genomics laboratory was developed through acquisition of equipment in WP 1 and WP 2, enabling cooperation with EU partners in high quality research in the fields of food quality, genomics and biotechnology.

The activity of the Centre was to provide the possibility of improving and achieving the high quality research capacity based on the priorities covered in Theme 2 of the FP 7 Cooperation Programme (Food, Agriculture and Fisheries and Biotechnology) contributing to creating a European Knowledge-Based Bio-Economy.

All the activities supported creation of international scientific consortia with participation of the Centre's scientists, capable of participation in wide scope, interdisciplinary and innovative joint grant proposals for research projects within FP 7, which are needed and expected by the European community, taking into consideration the potential threats of increasing risk of civilization diseases and diet-related diseases.

The activities of the project were realised in cooperation with leading EU institutions that agreed to support the project of the Centre of Excellence ANIMBIOGEN in EU. The selected key strategic partners come from: United Kingdom (University of Nottingham, School of Biosciences; Roslin Institute; Manchester University; Birmingham City University), The Netherlands (Wageningen University and Research Centre), France: (INRA, CNRS), Germany (Research Institute for the Biology of Farm Animals Dummerstorf; University of Munich, Research Institute of Rural Areas, Forestry and Fisheries Trenthorst, University of Hohenheim, European Molecular Biology Laboratory), Italy (University of Teramo).

Project Results:

The main activities realised during the project are listed below:

1. Conferences: During the realization of the project there has been organized 5 conferences, 2 workshops and 1 seminar, financed with EU funds, with total participation of 691 persons from 24 countries, as well as 2 conferences and 2 scientific sessions, financed with the national funds, with the total participation of 290 people.
2. Visits of European scientists to the Centre: 9 European scientists visited the Centre (dr Michale Mayntz Sweden, dr Bruno Galy Germany, dr Irina Lagutina Italy, dr Ross Gordon Cooper United Kingdom, Malin Axel-Nilsson Sweden, Sofie Norman Sweden, dr Francesca Vinchi Italy, dr Cecile Bouton France, Professor Pasqualino Loi Italy) for short term exchange. Besides, 53 foreigners were speakers during the conferences and workshops at the Centre. They also met with Centre's researchers in order to discuss common projects and future co-operation. Moreover, they discussed terms of co-operation with WP leaders and met with groups of the IGAB junior scientists.
3. Outgoing visits of the Centre researchers to foreign institutions: there were organized 32 scientific visits financed with EU funds, as well as 21 scientific visits financed with national funds of researchers from the Centre mainly to European institutes and universities known for conducting extraordinary researches in order to carry out research and discuss areas of joint investigation. The visits were especially devoted to preparation of common proposals and work on common projects.
4. Recruitment there were recruited 5 scientists to the Centre (Professor Artur H. Swiergiel USA and Dr Alexey Sazanov Russia financed with EU funds; Dr Grayna Ptak - Italy, Professor Pasqualino Loi Italy and Dr Ewa Polawska Poland financed with national funds).
5. Meetings with SMEs there has been already organized 5 focused meetings with companies, with total participation of 216 attendees. During the meeting the researchers of the Centre met with the representatives of SMEs and industry. They discussed topics for cooperation, due to which the SMEs and industry can be incorporated in the R&D activities supported by EU funds. The meetings resulted in agreements on cooperation, as well as proposals for joint projects, e.g. BIOFOOD innovative, functional products of animal origin project realised in consortium with nine domestic research institutions and six SMEs (dairy processing, meat industry) with a total value of around 10 million euro (including ca. 4 million euro for IGAB PAS) funded within the Innovative Economy Operational Programme funded by the European Regional Development Fund.
6. Promotion: The activity of ANIMBIOGEN in EU was widely promoted during national and international events through posters, information bulletin, presentations. The Centre's activity was promoted during e.g. the conference of International Project Management Association (IPMA), European Association of Research Managers and Administrators (EARMA), National Council of University Research Administrators (NCURA) in USA, Polish National Council of EU Research Projects Coordinators (KRAB) and the Conference WIRE 2012 Week of Innovative Regions in Europe organized by the European Commission and National Contact Point for Research Programmes of the EU. The Centre was also promoted in various

media, including: TV (TVP1), newspapers (Gazeta Wyborcza) and journals: The Parliament Politics, Policy and People, International Innovation, Aktualności Targowe (Trade Fair News), as well as two articles in the brochures Polish Success Stories in the 7th Framework Programme and Polish R&D Potential Stairway to Excellence? published by the National Contact Point in Poland, on the web-page <http://www.ighz.edu.pl/animbiogen> and in the internet database of projects run by the National Contact Point in Poland.

7. There were published 11 scientific papers in connection to the Centre activities, further publications are under preparation. There were also 5 conference papers presented.
8. Advisory Board Meetings: there were organized 4 meetings of the International Advisory Board in order to discuss and evaluate the activity of the Centre of Excellence.
9. The scientists of the Centre participated in 8 consortia preparing grant applications for the FP7 calls.

Two proposals were positively evaluated and accepted for funding:

- - AWARE - Animal Welfare Research in an enlarged Europe, GA no. 265686, FP7-KBBE-2010-4, Person responsible from IGAB PAS - Professor Tadeusz Jezierski
- FECUND - Optimisation of early reproductive success in dairy cattle through the definition of new traits and improved reproductive biotechnology, GA no. 312097, FP7-KBBE-2012-6-singlestage, Person responsible from IGAB PAS - Professor Jacek A. Modliski

Four proposals were positively evaluated but not accepted for financing:

- WelPro Welfare in progress: further developing and integrating animal based welfare assessment, proposal no. 265679, FP7-KBBE-2010-4, Person responsible from IGAB PAS - Aleksandra Górecka-Bruzda PhD DSc
- Sustainable-Dairy Improving environmental impacts, animal health and welfare, product quality, productivity and economic performance in European organic and low-input dairy production systems, proposal no. 265868, FP7-KBBE-2010-4, Person responsible from IGAB PAS - Tomasz Sakowski PhD DSc
- embryo Identification of common and divergent pathways of early cell lineage specification during mammalian preimplantation development, proposal no. 310759, ERC-2012-StG_20111109, Person responsible from IGAB PAS - Professor Jacek A. Modliski
- SMART-Organic Sustainable health management of animals through resistance, nutrition and therapeutics in organic livestock production, proposal no. 311901, FP7-KBBE-2012-6-singlestage, Person responsible from IGAB PAS Tomasz Sakowski PhD DSc

Two consortia are preparing applications which will be submitted for the last FP7 calls:

- FP7-KBBE.2013.2.4-01, Assuring quality and authenticity in food chain, Person responsible from IGAB PAS Professor Jaroslaw Horbaczuk, Mariusz Pierzchala PhD DSc

- FP7-Health-2013-Innovation-1, Person responsible from IGAB PAS Professor Artur wiergiel

10. The scientists of the Centre have prepared also 4 grant applications to the bilateral programmes:

- Professor Lech Zwierzchowski from IGAB PAS proposal for bilateral research project with Chair of Livestock Biotechnology, Technical University of Munich, Germany (under evaluation),
- Ewa Polawska PhD from IGAB PAS proposal for bilateral research project within Polish-Flanders cooperation programme with Laboratory for Animal Nutrition and Animal Product Quality, Department of Animal Production, Ghent University, Belgium (under evaluation),
- Tomasz Sakowski PhD DSc from IGAB PAS - proposal for bilateral research project within Norway grants with BIOFORSK AS, Norway (under preparation),
- Emilia Bagnicka PhD DSc from IGAB PAS - proposal for bilateral research project with Department of Animal Aquacultural Sciences, Norwegian University of Life Sciences, Norway (not accepted for funding).

11. There were reached 4 agreements on cooperation with foreign partners: Wageningen UR (the Netherlands), University of Teramo (Italy), University of Manchester (UK), Technical University of Munich (Germany).

For efficient implementation, the activities were divided into 6 work packages. Each work package was further divided into tasks. The tasks were distinguished for operational and management reasons. Three work packages (WP 1, WP 2, WP 3) were divided thematically. These work packages consist of conferences aimed at improving knowledge of the Centre's scientists and exposing them to more international environment, workshops developing practical skills of the scientist and introducing them to some modern laboratory equipment, exchange visits, recruitment of scientists and purchasing laboratory equipment.

Work package 4 consisted of focused meetings with the representatives of commercial companies and is meant to increase cooperation with SMEs and industry in the realisation of research priorities within FP 7, as well as enhance commercialization of research and development.

Work package 5 was devoted to the overall promotion of the Centre and its activity. It facilitated attracting scientists and SMEs to the Centre and finding new partners for cooperation. Since it improved the international visibility of the Centre it was closely connected with activities in all other work packages. All publications connected with project activities are listed in WP5..

Work package 6 consisted of coordination and management activities and as such was interconnected with all other work packages.

The results are presented according to respective Work Packages.

1.3.1 Work Package 1 - Sustainable systems of animal production for product quality, consumer health, animal welfare and protection of biological resources

WP leader: Professor Marek ukaszewicz

This WP was focused on sustainable systems of animal production for product quality, consumer health and animal welfare, as well as application of genetic tools useful for breeding animals for sustainable production systems. There was an emphasis on food quality with special reference to bioactive components and their benefit for human health. Animal welfare aspects in production chains of different farm animals were also considered. The WP involved three two-day conferences, a program of staff exchange and recruitment of experienced researchers, as well as development of equipment of food quality improvement laboratory. The activities were divided into 6 tasks:

Task 1.1. Conference on improvement of quality of animal products obtained in sustainable production systems with special reference to bioactive components and their benefit for human health

Within this task a two-day international conference on Improvement of quality of animal products obtained in sustainable production systems with special reference to bioactive components and their benefit for human health was organized in Jastrzebiec n/Warsaw, Poland on May 14-15, 2009, with the participation of speakers from outstanding EU research institutions and total of 129 participants.

The main topic of this conference was the improvement of quality of animal products (milk, meat and eggs) obtained in sustainable production systems (low input and organic) with special reference to bioactive components and their benefit for human health. Detailed information available in Deliverable D.3.

Task 1.2. Conference on molecular and population genetics for improvement of farm animals

Conference on Molecular and population genetics for improvement of farm animals and their products was organized in Jastrzebiec n/Warsaw, Poland on May 27-28, 2010, with total participation of 90 persons. The main issues considered during the conference were: nutrigenomics, genetic-epidemiology models, immune and vaccine response in animals, genetics of udder health, bovine histocompatibility complex and neurodegenerative diseases. The numerous research results were presented to the audience. Detailed information available in Deliverable D.6.

Task 1.3. Conference on welfare of farm animals

Conference on Welfare of farm animals was organized on Jastrzebiec n/Warsaw, Poland on June 7-8, 2011, with total participation of 68 persons.

The selected main topics covered by the lectures were: animal welfare definitions and different approaches, methods of welfare assessment, the role of husbandry procedures and handling for farm animal welfare, selection and breeding programs in relation to welfare of farm animals, the impact of housing systems and management on farm animal welfare, the role of human-animal interactions for animal welfare, animal welfare legislation, society awareness and attitudes, animal welfare implementation in organic and conventional farms. An important part was the presentation of a new

project: AWARE Aware WellAre Research in an enlarged Europe?, FP7-KBBE-2010-4: Improving integration in farm animal welfare research in an enlarged Europe. The coordinator of this project is Vyzkumny Ustav Zivocisne Vyroby V.V.I Uhrineves in Czech Republic and IGAB PAS is one of the thirteen partners. Its participation in the AWARE project is a result of a significant research cooperation in the ANIMBIOGEN in EU project. Detailed information available in Deliverable D.17.

Task 1.4. Exchange of know-how and experience, twinning and networking in the field of sustainable systems of animal production

This task covered exchange of know-how and experience between the Centre and leading European laboratories through exchange of researchers, short and long-term study visits and two-way secondments. According to the work plan of this work package there were organized 12 short-term visits of the researchers from the Centre to the foreign institutions. The outgoing visits are listed and described below.

- Dorota Lewczuk PhD DSc Institut National de la Recherche Agronomique, Haras National Le Pin, France, 25.03.2009-27.03.2009. She took part in the working meeting considering possibility of joining Interstallion activities with Polish breeding value estimation of horses to widen the knowledge about the nowadays state of Interstallion activity.
- Professor Zygmunt Reklewski, Tomasz Sakowski PhD DSc, Ewa Metera MSc - Agriculture Research and Education Centre in Raumberg-Gumpenstein, Austria, 01.04.2009-04.04.2009. The main aim of the visit was to see research outfit and discuss the terms of the future cooperation with a representative of the Agriculture Research and Education Centre within the frame of the organic agriculture investigation. Another purpose of the visit was the participation in the Federal Exhibition of the Simmental Cattle in Greinbach and observation of the new tendencies in the breeding programme of this breed.
- Professor Artur H. wiergiel European College of Neuropsychopharmacology Congress in Istanbul, Turkey, 12.09.2009-16.09.2009. Prof. wiergiel took part in the Congress as a member of a scientific program committee of the next ECNP meeting (Amsterdam, The Netherlands, 2010) and presented 4 communications, reviewed and published. The most important aim of the visit was to intensify the international cooperation in the field of animal and human behaviour.
- Professor Tadeusz Jezierski, dr Aleksandra Górecka-Bruzda University of Bodenkultur, Vienna, Austria, 21.09.2009-23.09.2009. The scientists took part in the meeting of the consortium preparing a grant application for the FP 7 of the EU. The proposal full title is Animal Welfare Research in an enlarged Europe AWARE?. The proposal was favorably evaluated and accepted for funding (GA no. 265686).
- Dr Aleksandra Górecka-Bruzda Swedish Agricultural University, Sweden, 28.11.2009-31.10.2009. Dr Górecka-Bruzda attended EU Equus 2009 The Future Horse Industry in Rural Areas and Society organized by the Federation of Swedish Farmers, the Swedish horse Council Foundation, the Swedish Board of Agriculture and the Swedish University of Agriculture concerning the future competitiveness, development and social benefit of the European Horse Industry to prepare the EU project on the welfare assessment in horses with partners from SLU and Wageningen UR-Livestock Research. Dr Aleksandra Górecka-Bruzda

took part in the meeting of the consortium preparing a grant application for the FP 7 of the EU. The proposal full title was Welfare in progress: further developing and integrating animal based welfare assessment - WelPro?.

- Tomasz Sakowski PhD DSc Newcastle University, Nafferton Ecological Farming Group (NEFG), Nafferton Farm, United Kingdom, 11.11.2009-15.11.2009. The main aim of the visit was participation in the consortium meeting and discussing the experimental design of the project prepared for FP7-KBBE-2010-4 call in topic Sustainable organic and low input dairy production and also discussing the terms of the future cooperation with NEFG of Newcastle University within the frame of the organic agriculture investigations. The proposal full title was Improving environmental impacts, animal health and welfare, product quality, productivity and economic performance in European organic and low-input dairy production systems?. The Coordinator: Professor Illias Kyriazakis from Newcastle University (UNEW), UK. The proposal was favorable evaluated by the Commission services with the help of independent experts and was ranked second not accepted for funding.
- Dr Aleksandra Górecka-Bruzda - Institut National de la Recherche Agronomique (INRA) Tours-Nouzilly, UMR 6175 Physiologie de la Reproduction et des Comportements, France 24.11.2009-18.12.2009. The main aim of the visit was the preliminary preparation of the common research project related to the animal welfare, perfecting the techniques used in the research of animal behaviour.
- Grazyna Sender PhD DSc, Jolanta Oprzadek PhD DSc International Symposium on Animal Genomics, Paris, France, 30.05.2010-04.06.2010. The main goal of the visit was presenting a paper Association of bovine lactoferrin gene polymorphism with occurrence of sub-clinical mastitis caused by staphylococcus species and finding new partners for cooperation.
- Professor Artur H. Swiergiel International Behavioral Neuroscience Society, 19th Annual Meeting, Sardinia, Italy, 07.06.2010-13.06.2010. The main aim of the visit was participation in the meeting and discussing the future cooperation with IBNS and the experimental design of a new project in the field of animal and human behaviour.
- Professor Edward Dymnicki, Professor Jaroslaw Horbaczuk, Jolanta Oprzadek PhD DSc - 60th Annual Meeting of the European Federation of Animal Science, Barcelona, Spain, 24.08.2009-27.08.2009. The title of the meeting was Biodiversity and Sustainable Animal Production Systems?. The main aims of the visit were to attend presentations and take part in workshops and discussions on the latest and most relevant research issues in the field of animal science and quality of animal products. The meeting was also a great occasion for updating knowledge and acquiring new ideas in the field of animal production methods regarding their health and welfare.
- Tomasz Sakowski PhD DSc Sivas, Greece, organic farm in Sivas led by Ecological Farming Group (NEFG), Newcastle University, UK, 01.08.2011-04.08.2011. The main aim of the visit at Sivas was participation in the first consortium meeting and discussing of the experimental design of the project prepared for FP7 - KBBE.2012.1.4-04 call titled: Improved management practices and alternative treatments to improve animal health in organic farming systems and determining the terms of the future cooperation with consortium partners within the frame of organic agriculture investigations. The prepared project was titled: Sustainable health

management of animals through resistance, nutrition and therapeutics in organic livestock production?. It was evaluated positively and received 12 points.

- Justyna Jarczak MSc - Norwegian University of Life Sciences in As, Norway, 07.11.2011-05.12.2011. The main aim of the visit was learning the method to determine gene polymorphism S1 casein (CSN1S1) using sequencing method in order to apply for the bilateral HARMONY project in cooperation with researchers from Norwegian University. Working with sequencing and SNP searching is now continued in IGAB PAS. The Institute has appropriate equipment and it is possible to sequence selected fragment of gene of Polish goat. Research paper regarding polymorphism of CSN1S1 gene in Polish dairy goat population is under preparation. Further cooperation with researchers from University of Life Sciences in As and preparation of a new common project are planned.

Two visits of foreign scientists were also organized:

- Dr Michale Mayntz from Malardalens Hogskola, Department of Biology and Chemical Engineering, University of Stockholm, Sweden on 03.05.2010-16.05.2010. The main aim of his visit to the CoE ANIMBIOGEN in EU was to discuss the following issues: ontogeny of suckling behavior, factors affecting the occurrence of two ways of suckling movement in Bos Taurus, comprehensive description of suckling activities in Bos Taurus, the changes of milk composition during suckling meals in Bos Taurus.
- Dr Ross Gordon Cooper from Birmingham City University on 19.03.2011-27.03.2011. The main aim of his visit to the CoE ANIMBIOGEN in EU was to discuss the following common research topics: the determination of milk acidity (pH, SH), the content of basic components of milk, the nutritive value of feeds for ruminants according to the INRA system, the quality of game meat including nutritive value and health properties.
- Two junior scientists: Malin Axel-Nilsson, Sofie Norman from the Department of Animal Environment and Health, Section Ethology and Animal Welfare, Swedish University of Agricultural Sciences (SUAS) in Uppsala, Sweden on 04.07.2011-19.07.2011. There was agreed with SUAS an exchange of two junior scientist. During the stay two junior scientist took part in the welfare conference in Jastrzebiec and participated in common research in the Konik reserve and Research Station in Popielno, Poland, sharing the knowledge in this area.

Detailed information available in Deliverable D.9.

Task 1.5. Acquisition of research equipment for food quality improvement laboratory

In order to increase the research capability of the Centre in the fields of quality and improvement of food of animal origin, to develop and implement modern trends in areas of planned research and to enhance the possibilities of international cooperation in the field of healthy and high-quality food, the acquisition of the following new equipment was realised:

- The ICP-MS spectrophotometer which enables the use of the most powerful techniques for the analysis and quantification of trace elements. It is used for analysis of contents of macro- and micro-elements in meat, eggs, milk and dairy products. One of the greatest advantages of

ICP-MS is extremely low detection limit for a wide variety of elements being bioactive components of food with positive effects on human health. Possessing of such equipment shall enable to conduct high-quality research in cooperation with EU partners.

- The Pinnacle PCX postcolumn derivatization system which is designed to precisely and selectively separate analytes. It is an optimized HPLC post-column derivatization system for analysis of aminoacids, carbamates, mycotoxins, antibiotics and many other applications. The equipment was financed with national funds.
- The gas chromatograph which is a chemical analysis instrument for separating chemicals in a complex sample. Fatty acids, amino acids, cholesterol, vitamins and other nutritional components can be analysed. First papers including results obtained using the equipment are listed in section 1.4. The equipment was financed with national funds.

Task 1.6. Recruitment of experienced researchers

Two experienced researchers were recruited:

- Professor Artur H. Swiergiel, past employment at the Department of Pharmacology, Toxicology and Neuroscience, Louisiana State University, Health Sciences Center, USA. He was employed for 30 months, starting from March 1, 2010, funded for 10 months from EU funds and 20 months from national funds. Professor Swiergiel has got long-standing research involvement in broadly understood genomic, neurobiological and system approach in animal models and human organism. Additionally, he is dealing with problems related to the effects of nutrients on physiology and behavior and developmental processes in transgenic animals. He spent over twenty years studying and doing research outside Poland in different laboratories at the research institutions that are considered world leaders in the field of physiology and nutrition, genetics, pharmacology and behavior. He shall apply for the research project in the last FP7 call.
- Dr Ewa Polawska was recruited in July 2010 and started her work on November 1, 2010. She accomplished PhD studies and worked at the Kielanowski Institute of Animal Physiology and Nutrition of the Polish Academy of Sciences. One of her main research tasks at the Centre includes determination of influence of restricted feeding (energy and protein) on the content of fat and fatty acids profile in meat. She has applied for an international research project with partners from Ghent University, Belgium (waiting for evaluation).

The realization of this task had a significant positive effect on the overall performance of the Centre. Detailed information available in Deliverable D.19.

1.3.2. Work Package 2 - Molecular biology tools in animal breeding, health and product quality

WP leader: Professor Lech Zwierzchowski

Work package 2 was principally focused on molecular biology tools for animal breeding, health and aspects of product quality. Within this WP, there was organized a conference providing up-to-date

knowledge of the research on genome structure and function and a workshop on methods used in transcriptomics studies. There were also bilateral visits organized to facilitate the cooperation with key partners. Besides, there were recruited researchers experienced in the field of functional genomics, as well as equipment of functional genomics laboratory was developed through acquisition of microarray printer. The activities were divided into 5 tasks:

Task 2.1. Conference on functional genomics and its application for meat and milk quality

The task covered a 2-day conference on Functional genomics and its application in milk and meat quality organized in Jastrzebiec n/Warsaw, Poland on October 22-23, 2009 with a total participation of 96 scientists. The purpose of the conference was to transfer up-to-date knowledge as well as modern techniques used to develop the most effective methods for selecting genes with a particular influence on desirable traits, with particular reference to gene expression analysis, such as transcriptomics and proteomics studies. Detailed information available in Deliverable D.4.

Task 2.2. Workshop on methods of gene expression measurement in animal breeding and quality of animal products.

The workshop Methods of gene expression measurement in animal breeding and quality of animal products was organized in Jastrzebiec on October 18-22, 2010 with total participation of 58 persons.

The main objective of the workshop was to conduct training in modern techniques for genomic analysis. Particular emphasis was put on the techniques associated with transcriptomics which are the first step in gene expression studies. The training contributed to improvement of the skills of all participants from IGAB PAS and other cooperating scientific institutions from Poland and abroad, which would allow for better cooperation in the future common research projects.

Another result of the meetings and discussions carried on during the workshop was establishing the scientific collaboration between Dr Marinus te Pas (Animal Breeding and Genomics Centre, University Wageningen, Netherlands), Prof. Roberta Davoli (Bologne University, Italy) and the Department of Immunogenetics of IGAB PAS. The common projects would concern improvement of genomics research conducted on farm animals, focused on improvement of quality of animal products. The cooperation resulted in preparation of joint application for the last FP7 KBBE call under coordination of the Wageningen University and Research Centre. Detailed information available in Deliverable D.15.

Task 2.3. Exchange of know-how and experience, twinning and networking in the field of molecular biology tools in animal breeding, health, and product quality

This task was focused on exchange of know-how and experience between the Centre and leading European laboratories through exchange of researchers including short and long-term study visits.

These activities aimed at stimulating international cooperation and knowledge transfer, as well as participation of researchers from the Centre in international scientific programs.

According to the work plan of this work package there were organized 11 visits of the researchers from the Centre to the foreign institutions:

- Dr Pawe Lisowski Technical University of Munich, Germany, 01.06.2009-14.08.2009. The main aim of the visit was developing international cooperation, as well as getting practical experience with up-to-date research methods. Dr Lisowski participated in the investigation of the methylation status of the TH gene, IGF2, IGF2 antisense, H19, LEP and SCD in the livers of young bulls meat and dairy breeds of all ages.
- Dr Pawe Lisowski Medical Research Council (MRC), London, UK, NewMood meeting, 02.07.2009-06.07.2009. He participated in the working meeting of participants of the consortium preparing the new proposal to the FP 7. There was discussed the establishment of common method of microarray analysis of the results from various partners from different animal models.
- Dagmara Robakowska-Hyorek MSc Institut National de la Recherche Agronomique, URM 866 Differentiation Cellulaire et Croissance, Montpellier, France, 01.09.2009-16.12.2009. The aim of her visit was to learn the technique of culturing bovine satellite cells (from adult cattle) in order to realize cooperative research.
- Dr Pawe Lisowski 22nd Congress of the European College of Neuropsychopharmacology, Turkey. 13.09.2009-17.09.2009. The main aim of the visit was to exchange experience on the role of genetic background and tools for animal welfare and behaviour.
- Dr Pawe Lisowski Department of Medical Pharmacology, Leiden Amsterdam Centre for Drug Research and Leiden University Medical Center, Gorlaeus Laboratories, the Netherlands, 04.09.2009-13.09.2009. Dr Lisowski was trained in concepts of neurodevelopment programming of the stress regulating systems during health and disease over the lifespan. Topics included: developmental models, epigenetic, gene regulation, gene variants, nuclear receptors and stress hormones, which are the topics considered in the joint proposal of a new research project.
- Pawe Lipiski PhD DSc, dr Rafa Starzy'ski Roslin Institute, University of Edinburgh, UK 16.09.09-19.09.09. The main aim of the visit was the establishment of the scientific cooperation with prof. Harry J. McArdle and prof. Cheryl Ashworth including the invitation of two professors to participate in the new projects submitted within TEAM Programme of the Foundation for Polish Science.
- Dagmara Robakowska-Hyorek MSc - European Muscle Development Network, MYORES Workshop Mechanisms involved in Muscle Atrophy and Hypertrophy in Carmona/Andalusia, Spain, 14.11.2009-18.11.2009. She presented results of her research, attended lectures about process involved in the muscle physiology and pathology in livestock species and put great effort in establishing international cooperation.
- Agnieszka Sty MSc Institut de Chimie des Substances Naturelles, Centre National de la Recherche Scientifique in Gif-sur-Yvette, France, 01.03.2010-31.03.2010. The aim of the visit was to continue the common experiments on mechanisms of regulation of iron metabolism.

- Ewa Kosciuczuk MSc, Rafa Olbromski MSc 32nd Conference for the International Society for Animal Genetics, Edinburgh, United Kingdom, 26.07.2010-30.07.2010. The main aim of the visit was to take part in the conference which was attended by an international society of scientists and to observe the current tendencies in the field of animal functional genomics studies. Many of the presentations confirmed the overall tendency to conduct studies in a genome wide scale using the most advanced technologies such as Next Generation Sequencing. The majority of the workshop presentations and posters focused on the problem of DNA methylation and micro-RNA studies. Numerous discussions with specialists in this topic made it possible to plan new strategies for future scientific projects in the scope of cattle genomics, with special consideration of whole genome sequencing techniques that undoubtedly will be the main topic of cattle genome studies for the next decade.
- Dorota Goluch MSc 61 st Annual Meeting of the European Association for Animal Production, Heraklion, Greece, 23.08.2010-27.08.2010. The main aims of the visit were to participate in the conference and to present the results of the research project on the muscle cells and genomic polymorphism of regularly sequences of genes associated with quantitative and qualitative characteristics of meat from cattle and pigs.
- Mariusz Pierzchala PhD Dsc Animal Breeding and Genomics Centre, Wageningen UR Livestock Research, Lelystad, Netherlands, 25.03.2011-29.03.2011. The stay allowed for discussion about possible future collaboration. There were discussed two possible options: EU projects or joint projects towards the industry. It allowed for establishing stronger collaboration and to extend that cooperation in the future. The cooperation within the QPORKCHAINS project (FP6) was a good example. Therefore, the present cooperation allowed to prepare a scientific publication related to biomarkers utilized in porcine meat production that shall be submitted in 2012. These studies and additional future bioinformatics and systems biology data processing of pig production traits with emphasis on porcine meat quality, health status and rate of growth and development in cooperation with Wageningen UR Livestock Research made it possible to prepare an application project for the last FP7 KBBE call (FP7-KBBE.2013.2.4-01Assuring quality and authenticity in food chain).

Three visits of foreign scientists were also organized:

- Dr Bruno Galy from European Molecular Biology Laboratory, Heidelberg, Germany in the period 17.06.2010-18.06.2010. The main aim of the visit was the participation in the launch meeting of the Polish Iron Club, June 17-18, 2010, organized in Jastrzebiec n/Warsaw, Poland. During the meeting he delivered a keynote lecture entitled Posttranscriptional control of cellular iron homeostasis in mammals?. This meeting was focused on stimulating international cooperation and knowledge transfer, as well as participation of researchers from the Centre in international scientific programs in the above mentioned fields.
- Dr Francesca Vinchi, University of Teramo, Italy, 06-12.09.2011. Dr Vinchi is a member of research team directed by prof. Emanuela Tolosano, with which Dr. Lipinski's team from IGAB PAS has collaborated for few years. The subject of the scientific collaboration between both teams is the regulation of cellular and systemic heme metabolism in mammals. The visit aimed at establishing some details of the article prepared for the submission to the Biochemical Journal (the manuscript is now under review). Dr Vinchi and Dr. Lipiski designed also future experiments on heme oxygenase 1 knockout mice, which constitute an exceptional model for studying the expression of heme iron exporter - feline leukemia virus

sub-group C receptor (FLVCR) in the liver, duodenum and kidney. They also discussed possibility of application for joint research projects.

- Dr Cecile Bouton, Institut de Chimie des Substances Naturelles, Centre National de la Recherche Scientifique in Gif-sur-Yvette, France, 24-26.10.2011. Joint research was discussed of the two scientific teams of Dr Pawe Lipiski and Dr Cecile Bouton concerning role of iron regulatory proteins in the regulation of iron metabolism by nitric oxide. Furthermore, the visit gave the opportunity to develop reciprocal research opportunities between the research teams working on the role of nitric oxide in cellular iron metabolism.

Detailed information available in Deliverable D.10.

Task 2.4. Acquisition and development of research equipment of functional genomics laboratory

In order to develop the equipment of the functional genomics laboratory and make it fully operational, there was acquired a microarray printer the apparatus used to produce individually designed DNA-microchips to analyse expression profiles or for genotyping. The possess of such equipment enables active participation in innovative research in cooperation with European partners.

Task 2.5. Recruitment of experienced researchers

There was organized recruitment of one incoming experienced researcher:

- Dr Alexey Alexandrovich Sazanov from Laboratory of Molecular Genome Organization, Russian Research Institute of Animal Genetics and Breeding, Russian Academy of Agriculture Science, Saint Petersburg, Russia. He was employed for 2 months, financed by the EU funds, the main research topic of his work was Expression profiling of nine candidate genes for abdominal fat in broilers?. His employment contributed to publications of 2 scientific papers.

Detailed information available in Deliverable D.10.

1.3.3. Work Package 3 - Improving efficiency of basic and advanced reproductive technologies as a tool for multiplying valuable genotypes of farm animals.

WP leader: Professor Jacek A. Modliski

This work package was focused on mammalian experimental embryology and reproductive biotechnology specifically concerning nucleo-cytoplasmic interactions in early mammalian development, mammalian cloning, in vitro production of farm animals embryos and crypreservation of oocytes in order to improve the Centre's effectiveness and research potential in the mentioned areas. It consisted of a conference and a workshop enabling knowledge sharing and training scientists

in the mentioned subjects. A number of bilateral visits enhancing international cooperation were also realized. The activities of WP 3 are divided into 3 tasks.

Task 3.1. Conference on improving efficiency of basic and advanced mammalian reproductive technologies

Conference on Basic and advanced mammalian reproductive technologies was organized in Jastrzebiec n/Warsaw on June 9-11, 2010, with total participation of 89 scientists. This conference was focused on mammalian experimental embryology, mammalian somatic cloning and enhancement of oocytes and embryos quality as well as their cryopreservation in order to improve animal production. The general aim of this task was to improve the knowledge of biological aspects of cloning at the cellular, genetic and molecular level, providing up-to-date knowledge on cryoconservation of gametes and embryos in order to increase their cryocompetence (ability to sustain undisturbed developmental capabilities). Discussion also focused on in vitro production of embryos in order to obtain more blastocysts of good quality, which determines the efficiency of pregnancies and obtaining healthier offspring. Detailed information available in Deliverable D.7.

Task 3.2. Workshop on manipulations on mammalian gametes and embryos

The workshop Manipulation on mammalian and avian gametes and embryos took place in the Institute of Genetics and Animal Breeding, Jastrzebiec, Poland, in the period 23.05.2011 - 03.06.2011. The workshop was attended by 81 participants. Lectures were delivered by 15 speakers: 4 foreign speakers, 4 invited Polish scientists and 7 lectures from IGAB PAS. The workshop included 32,5 hours of lectures and 50 hours of demonstrations and practical exercises. The main topics of the workshop were the techniques of mammalian and avian embryology, including micromanipulation and molecular methods. The participants learned the methods of isolating the embryos in mammals (including mice, rabbits and cattle) and birds (quail), in vitro fertilisation and in vitro culture of the embryos. They also studied techniques of embryo manipulation, including micromanipulation (microinjection, chimaera production, production of transgenic animals) and various methods of genetic analysis of mammalian material. Participants also learned about novel cryoconservation methods of embryos and tissues and the basics of mammalian stem cell culture. The workshop contributed to improvement of the skills of participants that will positively influence possibility of participation in in the future common research projects (e.g. FECUND project in FP7). Detailed information available in Deliverable D.18.

Task 3.3. Exchange of know-how and experience, twinning and networking in the field of basic and advanced reproductive technologies

According to the work plan of this work package there were organized 4 outgoing visits of the researchers from the Centre to the foreign institutions, as well as 2 incoming visits. The outgoing visits are listed below.

- Krystyna yyska MSc University of Manchester, Faculty of Life Sciences, Berenika Plusa lab group, 01.08.2009-21.01.2010. K. y. paid a visit to the University of Manchester to learn new laboratory

techniques, including use of confocal microscope and to participate in a project of dr Joanna Grabarek: Developmental Potential of different lineages in mouse blastocyst.

- Prof. Jacek A. Modliski University of Edinburgh, University of Manchester, UK, 01.11.2009-08.11.2009. The main goal of the visit was to discuss the scientific cooperation with Professor De Sousa and to organize preparation of the new, common project related to mammalian experimental embryology and reproductive biotechnology (embryo, ERC-2012-StG_20111109).

- Professor Jacek A. Modliski, Anna Piliszek PhD PAN Biotech, Aidenbach, Germany, 23.03.2011-24.03.2011. Consultation from PAN Biotech specialist on cell culture conditions and media (specifically on culture of IGAB PAS cell lines) allowed to solve the problems encountered in the IGAB PAS cell culture facility, and will also help to improve the cell culture methods in the future. Newly established collaboration with PAN Biotech will benefit in cell culture methods improvements in IGAB PAS thanks to fully automated and controlled conditions using novel cell culture systems.. More importantly, future collaboration will allow IGAB PAS laboratories for conducting experiments which were not feasible using traditional methods, especially conducting innovative research in the fields of developmental biology and cell culture (including stem cell culture and derivation).

- Professor Jacek A. Modliski, Jolanta P. MSc, Magdalena Kotlarska MSc Teramo University, Italy, 27.03.2011-03.04.2011. During the visits the assumptions of the common research project were set, as well as the way of its realization both in the Department of Experimental Embryology and at the University of Teramo. The research will concern developing the new method of treatment of somatic nuclei which should increase the degree of their reprogramming in recipient cells. Both Jolanta P. MSc and Magdalena Kotlarska MSc were also familiarized with the techniques necessary to perform the experiment. The possibility of national or international grant application was also discussed. The visit contributed to preparation of the project FECUND.

Two visits of foreign scientists were also organized:

- Dr Irina Lagutina from Laboratory di Technologie della Riproduzione, Cremona, Italy in the period 22.07.2010-31.07.2010. The main aim of the visit was to exchange the results of research on mammalian experimental embryology and reproductive biotechnology in early mammalian development and mammalian cloning.
- Professor Pasqualino Loi, Department of Comparative Biomedical Sciences, University of Teramo, Italy, 01-30.08.2011. Professor Pasqualino Loi presented the novel method of somatic cell nuclei reprogramming (developed by prof. Loi) to the junior researchers of Experimental Embryology Department, IGAB PAS, and supervised implementation of the method in IGAB PAS. The new method allows for improved efficiency of mammalian cloning by somatic cell nuclear transfer. He discussed with prof. Modliski plans for new research that will be based on methodology developed by prof. Pasqualino Loi. There were prepared two manuscripts for publication, resulting from the joint research in 2010-2011. One of the papers Embryonic diapause is conserved across mammals was published in PLoS One.

Detailed information available in Deliverable D.11.

There was also organized recruitment of 2 incoming experienced researchers financed by the national funds:

- Professor Pasqualino Loi from the Department of Comparative Biomedical Sciences, University of Teramo, Italy. The period of employment at the Centre 3 months, from June 24, 2010. His employment and common research resulted in common scientific publications and application for joint projects (including FECUND).
- Dr Grazyna Ptak from the Department of Comparative Biomedical Sciences, University of Teramo, Italy. The period of employment at the Centre 9 months, from June 24, 2010. Her employment and common research resulted in common scientific publications and application for joint projects (including FECUND). She has also gained DSc degree at IGAB PAS.

1.3.4. Work Package 4 Cooperation with SMEs and industry

WP leader: Professor Edward Dymnicki

The main goal of this work package was to establish and facilitate cooperation of the Centre researchers with SMEs and industry active in the fields of the Centre's interest in order to promote the regional commercialization of research and development. There was a seminar with participation of entrepreneurs organized, as well as series of focused meetings. The work package was divided in two tasks:

Task 4.1. Facilitation of dissemination and use of scientific results

A Seminar on Intellectual Property Rights in the EU projects was organized in Jastrzebiec n/Warsaw on October 28, 2009. In the seminar participated over 80 people from various scientific institutions, industrial entities, patenting office and the National Contact Point of European Union research programmes in Poland.

The seminar covered topics related to Intellectual Property Rights (IPR) including various legal and economic aspects of protection, dissemination and use of research results. It increased the knowledge of participants and explained different forms of protection and dissemination of scientific results as seen from the perspective of researchers and entrepreneurs. During the seminar possible fields of cooperation between the Centre and commercial entities were presented. The seminar increased the knowledge of IPR issues among staff of the Centre and guests from other entities and showed the different perspective of researchers and entrepreneurs. The common understanding achieved during the seminar shall facilitate future research cooperation with SMEs and industrial partners. Besides the participants learned of specific FP 7 financial support to such cooperation and established contacts with possible project partners. The seminar achieved its aims and shall contribute to wider dissemination and use of scientific results. Detailed information available in Deliverable D.12.

Task 4.2. Focused meetings

The Centre aimed to attract different commercial partners, an emphasis was put on intensification of cooperation with SMEs and industry participating in the Technology Platforms that the Centre maintains contacts with (European Technology Platform for Farm Animal Breeding and Reproduction, European Technology Platform FOOD for Life and Polish Technology Platform for Food).

The Centre maintained contacts with commercial companies and organizations of producers active especially in food production and processing and animal breeding, in order to improve the quality and safety of food of animal origin.

The cooperation between the Centre, the Polish Technology Platform for Food (PTPF) and SMEs had been a key factor in the decision to give the green light to a multidisciplinary R&D project, BIOFOOD innovative, functional products of animal origin coordinated by IGAB PAS in Jastrzebiec. The project involves six industrial partners, primarily from the dairy processing and meat industries, as well as nine research institutions,. Due to this project 10 million euro has been made available in funding (ca. 4 million euro for IGAB PAS) from EU structural funds within the Innovative Economy Operational Programme funded by the European Regional Development Fund.

There were organized 5 focused meetings with commercial companies.

- The first meeting with companies was organized in Jastrzebiec n/Warsaw, Poland on March 4, 2009, with participation of 43 attendees. During this meeting the researchers of the Centre met with the representatives of SMEs and industry and discussed the importance of the international cooperation in the developing of the modern agriculture as well as topics for new international projects. The initiative was also to increase the number and value of projects conducted in conjunction with partners from the agrifood, biotech and biomedical sectors. The consortium of BIOFOOD innovative, functional products of animal origin project was also established during the first meeting with companies.
- The second meeting with companies was organized in azienki Chodzieskie, Poland on September 10-13, 2009 with participation of 26 attendees. The participants of the meeting focused on the production of the high quality milk positively influencing human health and visited a few cow and goat farms as well as dairy processing having good experiences in this field. At the end the scientists of the Centre and the representatives of SMEs and industry paid a visit to one of the biggest ostrich farms in Europe. The researchers and the members of the Polish Ostrich Breeding Association expressed interest in carrying on research in order to produce ostrich meat enriched in bioactive components.
- The third meeting with companies was organized in Jastrzebiec n/Warsaw on January 22, 2010 with participation of 71 attendees. The participants of the meeting discussed the possible ways of establishing and developing international cooperation and strengthening the Centre position in European scientific community, as well as gaining practical experience with up-to-date research methods of obtaining functional food. The meeting was combined with the kick-off meeting of BIOFOOD project.
- The fourth meeting with companies was organized in Jastrzebiec n/Warsaw, Poland on June 18, 2011, with participation of 18 attendees. During this meeting the researchers of the Centre met with the representatives of SMEs and industry and discussed the importance and health value of the ostrich meat in the modern agriculture. The representatives of the IGAB PAS presented the ostrich research results conducted in the BIOFOOD project. In the end the

importance of the international cooperation in the developing of the modern agriculture as well as topics for new international projects were strongly emphasized.

- There was also organized in Jastrzebiec n/Warsaw on June 17-18, 2010 a meeting of researchers and companies active in the field of iron researcher combined with the launch meeting of the Polish Iron Club, with total participation of 58 attendees. During this meeting, there were given presentations on the crucial role of iron in the human body, homeostasis process in mammals and the role of iron in metabolism. This meeting was focused on stimulating international cooperation and knowledge transfer, as well as participation of researchers from the Centre in international scientific programs in the above mentioned fields.

Detailed information available in Deliverable D.12.

1.3.5. Work Package 5 - Promotion and dissemination

WP leader: Cyprian Tomasiak

Promotion of the Centre activities was aimed at attracting new partners and facilitating new contacts, as well as creating opportunities for strategic partnerships and new joint research projects. Various activities of the Centre had a promotional aspect, for example conferences, workshops and meetings with SMEs not only facilitate knowledge transfer and develop the human potential of the Centre, but were also an occasion to show its potential to the partners, promote the human potential and infrastructure capacity of the Centre and its scientific fields of interest, showing opportunities for cooperation and creation of joint grant proposals for research projects. The work package 5 was divided into 3 tasks.

Task 5.1. Publications

Promotional materials were published in 2 versions short (leaflet in Polish and English) and medium (brochure in Polish and English) (Deliverable D.2). The materials were distributed among the general public during various events in order to draw attention of potential partners to the Centre and its activities. Besides, the activity of the Centre was promoted in various media: TV (TVP1), newspapers (e.g. Gazeta Wyborcza one of the largest newspapers in Poland with the daily issue of more than 300000 copies), journals (; scientific journals), newsletters (e.g. Bulletin of the Polish Academy of Sciences; scientific news of the Polish Press Agency), journals: The Parliament Politics, Policy and People, International Innovation, Aktualnoci Targowe fair's journal, two articles in the brochures Polish Success Stories in the 7th Framework Programme and Polish R&D Potential Stairway to Excellence? published by the National Contact Point in Poland,

In connection to the Centre activities in the reporting period there were published 11 scientific papers in the journal Animal Science Papers and Reports, edited by IGAB PAS and other journals (Deliverable D.21). Additionally, 5 conference papers were presented. All the papers are listed in section 1.4.

Task 5.2. Web-based promotion

A project website <http://www.ighz.edu.pl/animbiogen> was created (Deliverable D.1) for informational and promotional purposes. It includes broad information on the Centre and its topics of interest, as well as selected materials from the events organized by the Centre. The Centre was promoted also in various web-based databases and partner search services (e.g. CORDIS Partners Search, database of Polish NCP).

Task 5.3. Participation in fairs, information and brokerage events

The representatives of the Centre, participated in events organized abroad, as well as in Poland in order to establish direct contacts with potential partners including building of scientific networks and platforms with recognized European research institutions, spreading information about the Centre among the general public and specialists, gathering information on current possibilities of application for cooperation grants and sharing knowledge, ideas and experiences on participation in FP 7.

- Professor Jaroslaw O. H. and Cyprian Tomasik MA BSc joined the European Association of Research Managers and Administrators (EARMA) and participated in the annual conference Supporting and Sustaining Competitive Research in Europe in Copenhagen, Denmark on June 24-26, 2009, as well as in Braganca, Portugal on June 22-26, 2011. They established contacts with project managers and scientific institutions from Europe and USA interested in scientific cooperation and improvement of quality of international project's management and promoted the project Centre of Excellence ANIMBIOGEN in EU.

Within the International Research Management Fellowship Programme (IRMFP) of EARMA and NCURA (National Council of University Research Administrators) in the period Oct. 2-25, 2009 they visited the Ohio State University in Columbus, New York University and National Council of University Research Administrators (NCURA) Annual Meeting in Washington, USA. The main goals of the visit were: to have insight into the best practice in the research management in USA scientific institutions especially in the field of animal science and food quality, to promote the Centre and to establish contacts for the joint realization of research projects in the field of animal science and food quality.

- Professor Edward Dymnicki, Professor Jaroslaw O. H. and Cyprian Tomasik MA BSc participated in XIII Conference Project Management during global economic crisis organized by International Project Management Association Poland in Gdansk on Sept. 21-22, 2009. The representatives of the Centre participated in the session devoted to the possibilities offered by the 7th Framework Programme and presented the project Centre of Excellence ANIMBIOGEN in EU. They established contacts with innovative enterprises and scientific institutions interested in research cooperation.
- Professor Jaroslaw O. H. and Cyprian Tomasik MA BSc participated in the seminar of Krajowa Rada Koordynatorów Projektów Badawczych UE (KRAB) (Polish National Council of EU Research Projects Coordinators) in Kraków, Poland on Nov. 18-19, 2009. It was a 2-day seminar devoted to realization of research projects financed by the FP7. The representatives of the Centre presented speech on the Centre of Excellence ANIMBIOGEN in EU and exchanged experience on realization of projects within FP7. They also established

contacts with coordinators or research projects interested in cooperation. Moreover, several sets of ANIMBIOGEN in EU promotional materials were distributed among participants.

- Pawe Lipiski PhD DSc, dr Rafa Starzy'ski Heme Oxygenases in Biology and Medicine, 6th International Congress on Heme Oxygenases, Miami Beach, USA, 30.09.2009-04.10.2009. The scientists presented the poster entitled Regulation of iron metabolism in heme oxygenase-1 (HO-1) deficient mice?. The most important result of the visit was the establishment of contacts with possible partners for cooperation joint bilateral project was applied for.
- Cyprian Tomasik MA BSc participated in the Conference WIRE 2012 Week of Innovative Regions in Europe organized by the European Commission and National Contact Point for Research Programmes of the EU (NCP Poland) in Krakow, Poland on 4-5 June 2012. He participated, inter alia, in the session devoted to the Research Potential Activity of FP7 and in the poster session.
- Cyprian Tomasik MA BSc participated in the Seminar Looking for management solutions supporting increase of efficiency of R&D in scientific units in Rzeszow, Poland, 14-15 April 2011, organized by the Economic University in Kraków, National Contact Point for Research Programmes of the EU (NCP Poland), Polish National Council Coordinators of EU Research Projects (KRAB), Education for Entrepreneurship association and Aviation Valley association. There was gained knowledge of various possibilities of organization of Research Support Office, as well as various forms of cooperation with industrial partners. The presented tools can be included in the future scientific projects. The representative of the Centre accomplished also the postgraduate studies on Management of Research Project and Commercialization of Research Results financed by the European Social Fund (Oct. 2011 Jun. 2012) and received IPMA D certificate (Certified Project Management Associate) of the International Project Management Association. Professional project management tools shall be used in the future research projects run by IGAB PAS.

Detailed information available in Deliverable D.13.

Additionally, in July 2012 Professor Jaroslaw Horba czuk, Mariusz Pierzchala PhD DSc and Cyprian Tomasik MA BSc participated in the Info Day and Brokerage Event on Call FP7-KBBE-2013-7 organized by the European Commission and paid visits to the Ghent University, Belgium and the Wageningen University, Netherlands. These visits were financed with national funds. They contributed to the participation of IGAB PAS in the consortium preparing grant application for call: FP7-KBBE.2013.2.4-01, Assuring quality and authenticity in food chain.

1.3.5. Work Package 6 - Coordination and management

WP leader: Professor Jaroslaw O. H.

The activities of this work package were realised by the Coordinator, Project Manager and Project Secretariat staff.

Task 6.1. Coordination of the project activities

The main activities of this work package included: coordination of the activities of all work packages; setting up administrative procedures for the project and for reporting to the EC; setting up the Secretariat of the Centre and daily administration of the project; financial management and control; ensuring that contractual obligations are fulfilled and deliverables are prepared on time; collecting the project documentation with special regard to deliverables; timely preparation and submission of contractual periodic and final reports (Deliverables D.14, D. 16, D. 23, D.24, D. 25); timely organization of audits and submission of certificates on financial statements; monitoring progress of the project with special regard to quality and timeliness of actions, as well as complying with grant agreement and internal procedures; organization of the meetings with the International Advisory Board members and Coordination Board; communication with the European Commission; ensuring daily information flow within the project team and contact with the International Advisory Board. The planned activities for all WP's were discussed during periodic Coordination Board meetings and meetings with members of the International Advisory Board. The realisation of the project was constantly monitored.

International Advisory Board Meetings:

There were organized 4 International Advisory Board Meetings:

- The first International Advisory Board Meeting was organized in Jastrzebiec n/Warsaw, Poland on May 13, 2009 with participation of 16 attendees and junior scientists of the Centre. During the kick-off meeting of the International Advisory Board of the Centre of Excellence ANIMBIOGEN in EU (Panel 1) there were discussed the overall objectives and planned activities of CoE ANIMBIOGEN in EU. The guest of honour was professor Micha Kleiber the President of the Polish Academy of Sciences and Polish representative at the European Research Council who gave a speech considering the cooperation possibilities offered by the 7th Framework Program with special emphasis on the IDEAS Specific Programme. The junior scientists presented also, in a number of short speeches, the research topics undertaken at the Centre. Their presentations were discussed in details in order to identify possibilities for establishing research cooperation with institutions represented by the Board members.
- The second International Advisory Board Meeting was organized in Jastrzebiec n/Warsaw, Poland on October 23, 2009, with participation of 8 attendees (Panel 2). The main part of the meeting was devoted to EU programs which open new perspectives for collaboration between scientific units and the participants.
- The third International Advisory Board Meeting was organized in Jastrzebiec n/Warsaw, Poland on June 9, 2010, with Participation of 7 attendees (Panel 3). The participants discussed the infrastructure and animal facilities at their institutions available for joint research and possible topics of further cooperation. They showed interest in exchanging of scientific staff and other forms of cooperation with the Centre, underlined the importance of mutual benefits for both cooperating institutions and necessity of integration of the subjects of research. The meeting concluded with the proposal of the members of the International Advisory Board to provide them with detailed scientific resume of the Centre researchers in order to further evaluate possibilities of cooperation. The participants expressed also interest in joint application for research grants to the FP7.

- The fourth (closing) International Advisory Board Meeting was organized in Jastrzebiec n/Warsaw, Poland on May 22-23, 2012 with participation of 50 stakeholders of the Centre. At the beginning of the meeting Professor J. H.(Coordinator of the Centre) presented shortly the achievements of the Centre and asked IAB members for comments and suggestions on its future operation. Then, the WP Leaders presented results of respective Work Packages .

During discussion there were several important points raised that should be taken into consideration in the future, including: strategies for preparation of new research project proposals and cycles observed in receiving EU funds in various institutions, importance of the politics of project coordinators influencing the scientific activities of the project, an important role of efficient Research Support Office at IGAB PAS and other research institutions, an importance of COST actions, the research strategy of IGAB PAS, possibilities of keeping young people in science. On the second day junior scientists of IGAB PAS presented their research achievements. At the end, participants had an opportunity to discuss with IAB members scientific matters and opportunities for further cooperation. Detailed information on IAB Meetings is available in Deliverables D.8 and D.22.

1.3.6 Additional Activities

1. Additionally, there were organized two conferences and two scientific sessions financed by the national funds:

- Symposium on Realization of EU Research Projects in Poland organized in cooperation with KRAB (Polish National Council of EU Research Projects Coordinators) on May 12-13, 2010, with participation of 51 attendees.
- First International Conference on the Restoration of Endangered and Extinct Animals was organized in Jastrzebiec n/Warsaw, Poland on May 17-19, 2010, with participation of 99 attendees. The Conference was organised in cooperation with the Department of Biochemistry and Biotechnology of the Pozna University of Life Sciences and the Polish Foundation for Restoration of the Aurochs.
- The scientific session Nobel Prize 2010 in Medicine and Physiology was organized by the Institute of Genetics and Animal Breeding PAS in cooperation with Warsaw Scientific Society, Medicine and Biological Departments, Biological Faculty of Warsaw University, on the 14th December 2010. More than 60 people attended the session.
- The scientific session, Nobel Prize 2011 in Medicine and Physiology was organized by the Institute of Genetics and Animal Breeding PAS in cooperation with Warsaw Scientific Society, Medicine and Biological Departments, Biological Faculty of Warsaw University, on the 6th December 2011. More than 80 people attended the session..

2. ANIMBIOGEN in EU supported creation of a new large R&D project BIOFOOD innovative, functional products of animal origin in consortium with nine domestic research institutions and six SMEs (dairy processing, meat industry) within the Innovative Economy Operational Programme funded by the European Regional Development Fund which is coordinated by IGAB PAS in Jastrzebiec. The total value of the project is around 10 million euro (including ca. 4 million euro for IGAB PAS).

3. There were also organized the following 21 visits of the researchers from the Centre to the foreign institutions financed by the national funds. They visited: University of Manchester, United Kingdom; University of Cambridge, United Kingdom; Dublin City University, Ireland; University in Ghent, Belgium; Wageningen UR Livestock Research, the Netherlands; Radbound University, Nijmegen, the Netherlands; Chair of Livestock Biotechnology, Technical University of Munich, Germany; Swedish Agricultural University, Uppsala, Sweden; Norwegian University of Life Sciences, As, Norway; University of Milano, Italy; University of Padova, Italy; Regional Service for Agri-food Research and Development, Gijon, Spain; University of Stellenbosch, Republic of South Africa; The International Bioiron Society (IBIS), Vancouver, Canada.

The visits were mostly focused on preliminary studies and preparation of common proposals and work on common projects. These visits contributed to the achievement of the aims and milestones of the project.

Potential Impact:

Main impacts of the ANIMBIOGEN in EU project were connected to upgrading the capacity of research, technology and development activity of the Centre. They were fully achieved and included:

- Increase of a number and value of EU research grants and projects with participation of SMEs and industry connected with improvement of research management (8 projects in the years 2009-2012).
- Human potential, i.e. increasing the number and training of research staff (13 new employees; 9 new PhD degrees, 7 new DSc degrees, 2 new full professor titles in the years 2009-2012).
- Material potential, i.e. the acquisition of research equipment (ICP-MS spectrophotometer, the microarray printer, the Pinnacle PCX postcolumn derivatization system and the gas chromatograph).
- Significant improvement of quality of research demonstrated, among others, by number of original papers published in recognized journals (201 papers in the years 2009-2012).
- Increasing the impact factor of journal Animal Science Papers and Report covered in JCR list and published by IGAB PAS due to strengthening the international cooperation (from 0.214 in 2009 to 0.553 in 2012).

These impacts were achieved, inter alia, through: training and improving skills of all research staff of the Centre through attending the series of 7 international conferences and 2 workshops organized by the Centre with participation of outstanding scientists from leading EU scientific institutions, as well as through bilateral exchange of research staff with recognized EU laboratories (65 visits) and recruitment of 5 experienced researchers. The research infrastructure of the quality of food of animal origin laboratory and functional genomics laboratory was developed through acquisition of equipment in WP 1 and WP 2, enabling cooperation with EU partners in high quality research in the fields of food quality, genomics and biotechnology.

They impacts are showed in details in the table below.

Impacts of the ANIMBIOGEN in EU project

Indicator Period

Before ANIMBIOGEN (2001-2003) ANIMBIOGEN

(2004-2006) ANIMBIOGEN in EU

(2009-2011)

PLANNED

(Annex I) ANIMBIOGEN in EU

(2009-2012)

REALISED

Realised EU projects - number and budget for the Centre 0 2

(500 000 euro) 6

(1 800 000 euro) 6

(1 850 000 euro)

Scientific projects with participation of SMEs and industry number and budget 0 (0) 3

(200 000 euro) 3

(500 000 euro) 3

(4 648 732 euro)

Development of human potential of the Centre:

a) promotion to position of senior researchers (new associate professors - DSc)

b) employment of junior researchers

c) recruitment of experienced researchers

3

2

0

5

5

1

6

8

2

7

8

5

Original papers of Centre scientists published in journals listed in Journal Citation Reports (JCR) 92
134

(45% increase) 200

(49% increase) 201

(50% increase)

Rank of journal Animal Science Papers and Reports Not covered in JCR Covered in JCR Impact Factor around 0.5 IF2011 = 0.553

Development of research equipment value of equipment acquired during respective periods 400 000 euro 900 000 euro 1 500 000 euro 2 311 551 euro

In order to widen the impact of the project, during the realisation of the CoE ANIMBIOGEN in EU there was established cooperation with the International Research Management Fellowship Programme of EARMA (European Association of Research Managers and Administrators) and NCURA (National Council of University Research Administrators in USA) facilitating the exchange of research managers.

The Centre has also cooperated in management and promotional issues with Proteins in health and disease HEALTH-PROT project realized by the International Institute of Molecular and Cell Biology in Warsaw, Poland, funded by the 7th Framework Programme within the Research Potential theme.

Within the Polish Technology Platform for Food (cooperating with the European Technology Platform on Food for Life) the Centre's researchers contributed to the preparation of its Strategic Research Agenda and application for a large R&D project BIOFOOD innovative, functional products of animal origin realised in consortium with nine research institutions and six SMEs (coordinated by IGAB PAS) with a total value of around 10 million euro financed within the Innovative Economy Operational Programme funded by the European Regional Development Fund.

The Centre's scientists participated also in two thematic groups of the European Technology Platform for Farm Animal Breeding and Reproduction (FABRE).

Besides, during the Centre activities there was used infrastructure developed within the Bio-centre animal, food and human project realised by consortium of three research institutions financed within the Innovative Economy Operational Programme funded by the European Regional Development Fund and ICT infrastructure developed within the The development of ICT infrastructure to support research and exchange of knowledge in the fields of genomics, biotechnology and quality of products of animal origin project realised by the Institute of Genetics and Animal Breeding PAS within the Innovative Economy Operational Programme funded by the European Regional Development Fund.

There was also established cooperation with the Management of Research Project and Commercialization of Research Results project supported by the European Social Fund and coordinated by the Education for Entrepreneurship Association. The employees of the Centre participated in the activities funded by the ESF both as speakers and trainees.

In order to support integration of research programmes of European institutions with the FP 7 priority objectives and contribute to the development of a European Knowledge-Based Bio-Economy, the Centre attracted SMEs to participate in the FP7, e.g. the Osiciny Breeding Station has become partner in the FECUND project consortium.

The Centre is located in Mazowieckie Voivodeship (central region in Poland). Within the framework of cooperation with the local government, the Centre contributed to the idea of creation of Science and Technology Park in the Mazowieckie Voivodeship that would include the research areas of the Centre. It shall contribute to regional capacity building and improvement of economic and social cohesion of the region with whole EU.

As it was predicted at the beginning of the project:

- The research programme of the Centre was compatible with the List of leading science disciplines and research directions in Mazowsze region which is an integral part of The Mazowieckie Voivodeship Development Strategy until 2020 and is included in Regional Innovation Strategy of the voivodeship.
- The activity of the Centre contributed to the achievement of two main objectives of Innovative Economy Operational Programme which is a part of National Strategic Reference Framework 2007-2013 in Poland. The objectives are: increase of the impact of the research sector on the economy and enhancement of international links of the Polish science and economy.
- The Centre facilitated the creation of conditions for development of innovation potential in Mazowsze region which is one of the priorities of The Regional Operational Programme of the Mazowieckie Voivodeship 2007-2013?, as well as the increase of international competitiveness of Polish science, which is an aim of The Science Development Strategy in Poland until 2013?.
- The training and development of the scientists of the Centre and partner institutions from Poland contributed to reaching the aim of the Human Capital Operational Programme which is a part of National Strategic Reference Framework 2007-2013 in Poland, namely increasing the education level of the society by providing skills raising competitiveness on the labour market.

Exploiting results and disseminating knowledge of the Centre has been realized due to creating the modern training centre considering theoretical and practical aspects of genomics, biotechnology, sustainable production systems, food quality, animal welfare and biological resources and included:

- organization of conferences and workshops for research institutions, SMEs, industry and extension service (altogether 15 events in years 2009-2012),
- training of producers and farmers in different aspects of high-quality, safe food production in sustainable production systems, as well as on modern animal breeding technologies in sustainable production systems, with reference to animal welfare (several lectures at the Centre, as well as invited lectures at the Extension Service offices)
- wide range of services for farmers, extension workers, institutions and companies mainly related to animal production using modern laboratory tools for parentage control or detection of gene mutations in farm animals (parentage control of horses and gene mutations detections were done routinely in years 2009-2012, in cooperation with the Polish Association of Pig Breeders and Producers POLSUS new gene mutations tests have been developed).

Other important methods of disseminating knowledge by the Centre were:

- publications leaflets and brochures presenting activity of the Centre there were published leaflets and brochures both in English and Polish several hundreds of them were distributed to the wide public during events organized by the Centre (7 conferences, 2 workshops, 3

seminars), as well as during other events in which members of the Centre participated (conferences, information days, brokerage events, fairs).

- participation in fairs and brokerage events the members of the Centre participated in brokerage events in Brussels, as well as in international POLAGRA fairs in Poznań, Poland.
- website of the project there was website of the project created (<http://www.ighz.edu.pl/animbiogen>). The Centre was promoted also in various web-based databases and partner search services (CORDIS Partners Search, database of Polish NCP)
- proceedings from the conferences and workshops and scientific journal *Animal Science Papers and Reports* there were prepared printed proceedings of all the conferences and workshops that were distributed to participants of the events, as well as other interested parties, there were published 7 papers connected with the project activities in the *Animal Science Papers and Reports* journal edited by IGAB PAS:
 1. Hocquette J.F., Cassar-Malek I., Bernard-Cap el C., Picard B., 2009 Functional genomics and new markers for beef production minireview. *Animal Science Papers and Reports* 27(4), 273-279.
 2. Humpolicek P., Tvrdon Z., Urban T., 2009 Interaction of ESR1 gene with the FSHB and MYOG genes: effect on the reproduction and growth in pigs. *Animal Science Papers and Reports* 27(2), 105-113.
 3. G. E., Borys A., Borzuta K., Buczy'ski J. T., Lisiak D., 2009 Slaughter value, meat quality and backfat fatty acid profile in Zlotnicka White and Zlotnicka Spotted fatteners. *Animal Science Papers and Reports* 27(2), 115-125.
 4. Kleter G. A., Kok E. J., 2010 - Safety assessment of biotechnology used in animal production, including genetically modified (GM) feed and GM animals - a review. *Animal Science Papers and Reports* 28(2), 105-114.
 5. Liu G. Y., 2009 A novel HADHA gene differently expressed in muscle and other tissues from black-boned vs. ordinary sheep. *Animal Science Papers and Reports* 27(2), 127-137.
 6. Wimmers K., Murani E., Ponsuksili S., 2010 Pre- and postnatal differential gene expression with relevance for meat and carcass traits in pigs - a review. *Animal Science Papers and Reports* 28(2), 115-122.
 7. Wolf E., Bauersachs S., 2010 - Functional genome research in reproductive biology and biotechnology - a minireview. *Animal Science Papers and Reports* 28(2), 123-132

Moreover, 2 publications were published and 2 were accepted in other journals:

1. Grabarek J. B., Zyzynska K., Saiz N., Piliszek A., Frankenberg S, Nichols J., Hadjantonakis A. K., Plusa B., 2012 - Differential plasticity of epiblast and primitive endoderm. *Development* 139 (2012), 129-139.

2. Iuso D., Czernik M., Egidio F., Sampino S., Zacchini F., Bochenek M., Smorag Z., Modlinski J. A., Ptak G., Loi P., 2012 - Genomic integrity of lyophilized sheep somatic cells before and after nuclear transfer. *PloS One* accepted 2012.
3. Loi P., Modlinski J. A., Ptak G., 2011 - Interspecies somatic cell nuclear transfer: a salvage tool seeking first aid. *Theriogenology* 76 (2011), 217-228.
4. Polawska E., Horbanczuk J., Pierzchala M., Strzalkowska N., Jozwik A., Pomianowski J. F., Hoffman L., 2012 Effect of diet ary linseed and rapeseed supplementation on the fatty acid profiles of ostrich *m. gastrocnemius pars interna* and *M. iliofibularis*. *Meat Science* accepted 2012.

Additionally, 5 conference papers were presented:

1. Modlinski J.A., Ptak G., Loi P., 2011 interspecies somatic cell nuclear transfer a salvage tool seeking first air. IV Congress of Polish Biotechnology IV EUROBIOTECH 2011 Kraków, Poland, 12-15.10.2011 *Acta Biochimica Polonica* 58 (4), 138, (L.17.3).
2. Sampino S., Zacchini F., WIERGIEL A. H., MODLINSKI J. A., Loi P., PTAK G., 2011- Effects of blastomere biosy of preimplantation embryos on expression of imprinted genes and ankiety and depression like behaviours in mice. Polish Neurosci. Society 10th Intl Congress, ód, Poland. September 21-24, 2011. *Acta Neurobiologiae Experimentalis* 71, 42, (P1.15).
3. Zaccini F., Sampino S., WIERGIEL A.H., Modlinski J.A., Loi P., PTAK G., 2011 Effect of advanced paternal age on ultrasound vocalization in mice. Polish Neuroscience Society 10th International Congress, ód, Poland. September 21-24, 2011. *Acta Neurobiologiae Experimentalis* 71, 64, (P6.05).
4. Sampino S., Zaccini F., Modlinski J., wiergiel A., Loi P., Ptak G., 2011 Impaired postnatal growth after blastomere biopsy in mice. Meeting of the Ovarian Club. The Oocyte: from Basic Research to Clinical Practice, Barcelona, Spain, November 3-6, 2011, Abstracts nr. 28.
5. Polawska E., Lipi'ska P., Tolik D., J. A., S. N., Markiewicz-K'szycka M., H. J. O. - The influence of organic and inorganic selenium on fatty acid profile of ostrich meat. XXIV International Poultry Symposium WPSA, M., 12-14 Sept. 2012.

In order to facilitate the dissemination and exploitation of results, there was a seminar on IPR, dissemination and use of research result organized for over 80 participants, dedicated especially to commercial entities (SMEs and industry) interested in R&D cooperation.

There were also organized 5 focused meetings with companies (216 attendees) devoted to the knowledge sharing and discussion on R&D cooperation.

List of Websites:

Contact with the Centre

Postal address:

ANIMBIOGEN in EU

IGHZ PAN

Jastrzebiec, 1 Postpu St.

05-552 Magdalenka; POLAND

tel. +48 22 756 17 11; fax. +48 22 756-14-17

Project Coordinator:

Professor Jaroslaw O. H. PhD DSc

e-mail: j.horbanczuk@ighz.pl

tel. +48 22 736-70-00

Project Manager:

Cyprian Tomasik, MA, BSc

e-mail: c.tomasik@ighz.pl

tel. +48 22 736-70-03

Information on activities of the Centre can be found at the website:

<http://www.ighz.edu.pl/animbiogen>