In memoriam: Prof. Dr. Ferenc Kovács (1921-2015)

Prof. Dr.H.c. mpx. Ferenc Kovács, member of the Hungarian Academy of Science, beloved and honoured teacher and through many years' leader of the University of Veterinary Science, Budapest, and President of the Agricultural Committee of the Hungarian Academy of Science, in his 94th year of age, after long, but peacefully tolerated suffering gave back his soul to his Lord on 10th of May, 2015.



Ferenc Kovács was born on the 28th November, 1921 in a small village (Somogyszentpál, Hungary). After finishing with top marks his basic studies in the elementary and secondary schools he gained admittance to the then Veterinary Faculty of the Hungarian Agricultural University in 1948 and graduated in 1952 with the best qualification.

His professional career took start at the Department and Clinic of Internal Medicine where he worked for nine years (1952–1961). Beside his teaching liabilities he showed special interest for the digestive, circulatory and respiratory disorders of farm animals and distinguished himself by his diagnostic skill.

His research work yielded a new medicine against bovine fasciolosis (Distocain ad us. vet.) which was widely used and contributed to the control of this helminthiasis. His master and teacher, Professor János

Mócsy, the Head of the Department esteemed his capacities and by his suggestion the Council of the then High-School of Veterinary Sciences commissioned him with the leadership of the newly established "Study-Group for Animal Hygiene". By the 15/1962/Mg.É.14. Decree of the Ministry for Agriculture this Group became Department of Animal Hygiene in 1962 and Professor Ferenc Kovács was the first duly elected Head.

By his initiatives and enthusiastic work, the concept of animal hygiene has developed on continuous basis and gradually shaped to its present form. In his teaching animal hygiene is the branch of the veterinary science, which relying on knowledge of physiological and ethological demands of animals, describes the preconditions of health preservation and investigates the pathophysiological changes brought about by adverse environmental effects in order to gain information on the aetiology and pathomechanism of multifactoria (production) diseases. On this basis, animal hygiene systematises the preventive veterinary measures with special reference to their economic consequences. Animal hygiene deals primarily with herds and health protection of the herds, therefore the subject is more or less equivalent to the subject "herd health". The teaching curriculum has developed accordingly and was utilised in the gradual and post gradual education.

In order to gain experiences, he spent his sabbaticals in 1964 and 1966 at the Department of Animal Hygiene of the Veterinary Faculty in Munich. On this basis he built the first Environmental Laboratory in 1968 which was followed by a second one in 1973. These labs with their 12 environmentally controlled chambers and with their sophisticated equipment set foundation for intensive studies in the environmental physiology of livestock and poultry. Further to research in environmental physiology he organised and co-ordinated research programmes in the treatment, disposal and disinfection of liquid manure. With his supervision number of new information were gained and described with regard mycotoxin contamination of feed commodities. He studied and gained new data on the dynamism of vertical mobility of heavy metals, nitrates and mycotoxins in the soil-plant-animal-human chain.

Professor Kovács is known as founder of the International Society for Animal Hygiene. He has been honorary member of the Society and he was elected to honorary president of the Society at the 15th International Congress of the Society in Vienna in July 2011. He worked 26 years in the supreme leadership of the Budapest University of Veterinary Science. As Deputy Rector he served several terms between 1961–1973 and 1978–1981. In this position he made the scientific activity of the university organised, revived and systemised the post gradual education and extended the international connections of the University.

He served the university as Rector between 1973–1978 and 1983–1990. Major events of his activities included the organisation of the bi-centenarian commemoration and celebration of foundation of the Predecessor Institution of the Budapest University of Veterinary Science (1986). He was who launched the international teaching programme at the Budapest University of Veterinary Science, which by these days developed into an accredited and renown programme with diploma convertible all over the world.

He spent 9 years in the directorate of the Department of Agricultural Sciences of the Hungarian Academy of Science earlier as Deputy President (1990-1996), later as President (1996-1999).

In the 60 years of his professional career Professor Kovács authored more than 30 text-and handbooks or book chapters and hundreds of scientific publications and presentations at home and international scientific forums. The efficiency of his school is indicated by the performance of his disciples that embraces 2 Members, 3 Doctors and 12 Candidates of the Hungarian Academy of Science and 7 Professors. His scientific achievements were acknowledged by Honoris Causa Professorships at the Veterinärmedizinishe Universität Wien; Tierärztliche Hochschule Hannover, Univerzita Veterinärského Lekárstvá a Farmacie v Košiciach; Állatorvostudományi Egyetem, Budapest, Pannon Agrártudományi Egyetem, Kaposvár and Nyugat-Magyarországi Egyetem, Veszprém. He is holder of numerous home and international decorations including the Order of Merit of the Republic of Hungary with the Grand Cross. His home-folks (at Somogyszentpál) extended him Honorary Citizenship.

Professor Kovács was not only outstanding and conscientious tutor, researcher and leader but set example for us as human being. In his personality we lost our paternal friend and teacher who loved and esteemed his co-workers and disciples. He devoted himself to our veterinary profession and to our Alma Mater.

Honourable Professor, we preserve your memory in our hearts. Requiescat in Pace!

P. Sótonyi; M. Kovács; E. Brydl and P. Rafai (Magyar Állatorvosok Lapja, 2015. **137.** 323-330.)

His detailed path of life is summarised below on basis of the relevant chapter of the book entitled:

For modern animal hygiene. Six decades in the service of agricultural higher education.

Memorial book published for commemorating Professor Kovács's 90th birthday

(Published by Szent István University, Faculty of Veterinary Science, Budapest,

Eds. Endre Brydl and Melinda Kovács, Budapest, 2011. pp. 263-297)

FERENC KOVÁCS, PROFESSOR EMERITUS, ORDINARY MEMBER OF THE HUNGARIAN ACADEMY OF SCIENCES, TURNS 90

Ferenc Kovács, Professor Emeritus, Ordinary Member of the Hungarian Academy of Sciences

Ferenc Kovács was born on 28 November 1921. In 1948 he was admitted to the Veterinary Faculty of the Hungarian Agricultural University where he was granted a diploma of excellent record in 1952.

Invited by *Professor Mócsy*, he started his *career at the Department and Clinic of Internal Medicine*, an intellectual workshop and scientific school for him where research and veterinary practice were merged under the umbrella of *university education* and raised to a high standard even on global scale.

He ran practice classes, prepared demonstrations of large animal patients, and held lectures on subjects of internal disease diagnostics for a decade (1952–1961).

His *research work* was also commenced at the Clinic where he focused on the diagnostics and treatment of circulatory, respiratory and digestive diseases of farm animals. The Clinic was the first to perform ECG examinations on horses and had several novel casuistic reports published, as well. Ferenc Kovács was especially interested in revealing the aetiology, diagnostic methodology and prevention options of multifactorial diseases occurring in a large number of animals, the occurrence of which diseases was associated with the rather rudimentary status of large-scale animal production at that time.

The procedure he worked out for treating fasciolosis of domestic animals stands out of the projects he was involved with at the Department and Clinic of Internal Medicine. His research and development activity crystallised in the creation of the pharmaceutical product 'Distocain ad us. vet.' that was patented by the Hungarian Patent Office in 1959 and later – upon the recommendation of the World Organisation for Animal Health (Office International des Epizooties) – was used in numerous countries. The international patent procedure, as presented by Academician *Sándor Kotlán* at the 16th World Congress in Madrid, drew a great interest especially from the developing countries. Besides proving the efficacy of the product, he looked into its possible side effects and food sanitary aspects as well. Between 1954 and 1961 he published 36 scientific papers on subjects relating to internal medicine.

Having been charged with a new assignment by the executive board of the University, he stopped working for the Department of Internal Medicine in 1961. This is how Professor *Mócsy* praised his achievements in 1958: 'He is a professional characterised by a lively intellect, resoluteness and determination, extraordinary diligence and working ability, and not to a lesser extent, the love of his profession.' 'His achievements at school also serve as additional evidence for his extraordinary intellectual faculties. He has become one of our best young professionals not only known but really esteemed by all representatives of the Hungarian veterinary profession.' And here you have the words concluding the professor's characterisation: 'Ferenc Ko-vács' is one of the most promising and hopeful members of the young generation'.

His new task was to develop and cultivate the discipline of modern animal hygiene. In 1961 the College Council decided to establish an 'Animal Hygiene Group' to be headed by Associate Professor Ferenc Kovács within the confines of the Department and Clinic of Internal Medicine. According to *Directive No. 15/1962/Mg.É.14* of the Minister of Agriculture: 'The Animal Hygiene Group shall be separated from the Department of Internal Medicine and continue its operations as a self-standing Department of Animal Hygiene'. Upon the recommendation of the University Council he, as the head of this would-be independent department, became appointed Head of Department and in 1964 Professor and Head of Department.



Animal hygiene is a *multidisciplinary* science with a focus on environmental impacts on the health and production of farm animals as well as the effects exerted by animal husbandry on the environment. As the genetically determined performance of the animal stocks keeps increasing, the environment determining the realisation of that genetic potential should also keep changing dynamically. For this reason, presenting the curriculum in an up-to-date manner was no longer conceivable without thorough research work or the continuous synthesis of the international scientific achievements.

With the aim of familiarising himself with the latest achievements of his area of specialisation, Ferenc Kovács spent several months in Munich in 1964 and 1966 at the Department of Animal Hygiene of the Veterinary Faculty. With his experience considered, it was here where the first climatic laboratory with three microclimate-controlled animal houses was established in Central Europe in 1968; then, in the framework of major investment projects, the laboratory was extended with another nine climate-controlled houses in 1972–1973. The practical control of precise test results laid the foundations for, and kept enriching the modern environment-physiological teaching materials that both graduate and postgraduate training showed a great interest for.

In 1966, at the proposal of Academician *János Mócsy*, the Secretary of the Section of Agricultural Sciences of the Hungarian Academy of Sciences and Academician *Rezső Manninger*, the Vice-President of the Academy, an 'Academic Research Group' was established at the Department that, as a result, was to become much richer in terms of grey matter (four re-

searchers and three laboratory assistants were hired) and to receive remarkable subsidies from the Academy.

Thanks to *excellent teamwork*, it took hardly a decade for the Department of Animal Hygiene to become one of the university's most successful training and research centres. The teaching materials and the body of knowledge gaining form in lecture notes (1966–1969) gave ample material for the first Animal Hygiene textbook written by Ferenc Kovács, to be published in 1975, which was then followed by two augmented editions (1980 and 1990), both receiving an *award of excellence*. These publications were licensed as textbooks for all institutions of agricultural higher education by the Ministry of Agriculture and Food.

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Creating a new discipline. Having been appointed the Head of the Animal Hygiene Department, Ferenc Kovács focused his research efforts on exploring the causal relations between environmental impacts, production results and management technology-related multifac-



torial mass diseases, on developing environmental diagnostics, and studying the environment-polluting impacts of large-scale animal husbandry. The scrutiny of these areas was furthered by the 'Climate Laboratory Complex', this unique and first of its kind research centre in Central Europe, where Ferenc Kovács and his colleagues created the preconditions for accurate experimental work. It was here where an opportunity offered itself for revealing the optimal production environment of

different animal species and examining the interrelation between production results and climatic impacts that are non-compliant with physiological needs, on the one hand, and the disease-causing relationship between environmental impacts and certain facultative pathogenic agents, on the other. The research work of the Department was assigned to the key research project entitled 'The animal health conditions of large-scale animal keeping', qualified as such by the Presidium of the Hungarian Academy of Sciences.

As a result of their experiments, the researchers could point out factors that impeded production in large-scale pig-farming and, in particular, the interrelation between the environment and different mass diseases. They explored the relationship between the feeding of sows during gestation and the biological value of new-born piglets, the results of piglet rearing and economical pig fattening. They pinpointed multiple interrelations between the microclimate of buildings of closed system, production and mass diseases. Thanks to these studies, more could be learnt about the adverse impacts of environmental factors affecting the health of new-born and young calves as well as large-scale rabbit stocks. The findings of all these diverse experiments also contributed to the continuous enhancement of the curriculum of modern, intensive animal production and environmental protection.

The researchers' work based on thorough experiments and focusing on the properties, contamination, treatment and utilisation of *liquid manure* and its impact on arable land raised international interest. As regards this subject, the *Department of Animal Hygiene acted as FAO rapporteur*, and their results were offered to the member states, too. The results of studies on environmental load made veterinarians, agricultural engineers and physicians aware of the necessity of co-operation.

Just to mention a few priorities of this far-reaching research work:

- The scrutiny of the decisively important period of intrauterine life cast a new light on the notion of animal rearing;
- The researchers of the Department of Animal Hygiene were among the first in the world to determine and modify the notion of health that can be appreciated not through clinical manifestations but through production indicators;
- Exploration of the climatic-physiological requirements of Large White meat-type pigs;
- Working out the pathophysiological, morphological and economic interrelations of adaptation;
- Revealing partial interrelations between environmental loads, stress condition and active protective mechanisms in young animals, which furthered a deeper analysis of the aetiology of multifactorial diseases and their more efficient control;
- -The researchers demonstrated the environmental loading impact of the microbiological and chemical components as well as the utilisation options of liquid manure, which findings were then approved by the Food and Agriculture Organization (FAO), too;
- Globally, they were the first to present the dynamics of the vertical movement of heavy metals, nitrates and mycotoxins in the soil-plant-animal-human chain.

Foundation of the International Society for Animal Hygiene. The presentations held

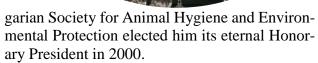


by Ferenc Kovács at various international forums and the fact that he was so keen to develop international contacts sowed the seeds of organised international co-operation in the discipline of animal hygiene.

To crown these efforts, the 'International Society for Animal Hygiene' was established upon his initiative in 1970 in Budapest; he worked as President of this Society for 6 years. The first congress of the Society was held in Budapest, at the Hungarian Academy of Sciences, in 1973. The event was attended by

nearly 500 delegates – with 200 guests from abroad – from 22 European countries. Later on the Society attracted animal hygienists from ever increasing number of countries to reach the present position when the Society numbers delegates from more the 50 countries of the World. Acknowledging his excellence Ferenc Kovács was appointed first Honorary Member (1976) later in 2011 the Honorary President of ISAH. The Hun-





Ferenc Kovács, Professor Emeritus and Academician worked for 26 years as an executive staff member of the University of Veterinary Science.

In 1961 he was appointed Deputy Director and became responsible for organising re-

search work at the College.

He was the *Vice Rector* of the institution in the periods of 1961–1973 and 1978–1981. He was commissioned to *organise and direct research activities* between 1961 and 1968. His appointment as Vice Rector in 1962 coincided with the *175th* anniversary of the University and its legal predecessors as well as the year when the College was raised to a university's rank. Shoulder with shoulder with *Gyula Sályi*, Rector and Academician, did he participate as his deputy in the organisation and implementation of the scientific programme related to the jubilee celebrations. His task was to organise scientific presentations and other events on the occasion of the jubilee. Also, he had a mission to organise scientific research work – something *until then unprecedented* at the university – and to supervise disciplinary, basic and applied research projects, and to organise contract-based research work.

He organised and was **in charge of** *postgraduate training* in the period between 1968 and 1973. Running postgraduate courses, but especially training specialised veterinarians implied *absolutely new tasks*. Launched in 1970, this latter activity was made necessary by the ever-increasing specialisation of production. The curriculum and principles governing these postgraduate studies were reviewed and taken over by several foreign (including Western) universities. To meet the ever-increasing demand for postgraduate training a 'Postgraduate Group' headed by *Professor Gyula Lami* was established, only to be met with recognition later on.

Professor Ferenc Kovács was in charge of organising and managing international relations in the period of 1978–1981. The cultural, scientific and technical co-operation agreements made between states, ministries and partner institutions and the personal contacts between researchers of similar specialisations served as a basis for international relations. Thanks to this kind of co-operation and personal invitations, lecturers and researchers had a chance to attend international scientific conferences, congresses and the events of various international associations in a great number of countries. The various forms of co-operation went hand in hand with the exchange of scientific publications and reviewers' reports issued for the purpose of gaining academic degrees. As for partner institutions located in Western Europe, they entered into co-operation schemes based on official agreements with universities of the longest standing traditions and the highest professional standard (Hanover, Vienna, Utrecht, Munich, Bologna,

Helsinki). An exchange of young lecturers and students became regular with these institutions, as well.

Ferenc Kovács discharged the Rector's duties of the University in the periods of 1973– 1978 and 1983–1990. During his first six years in this capacity large-scale farming had already become specialised and the ever more perceptible signs of would-be achievements were coupled with an increasing demand for a body of scientific knowledge. The curriculum had to be updated and there appeared new scientific disciplines in education. The development of the University could no longer be put off. Imre Dimény, the Minister of Agriculture and Food, approved the large-scale development project in 1967. András B. Kovács, the Rector of the time, laid the foundation-stone of the new facility in September 1969. It was during Ferenc Kovács's time as Rector that the project had to be performed and completed and the buildings commissioned with practical needs in mind. The four new buildings, the first stage of the construction, incorporating 9 departments and other educational units + the new climate laboratory were opened in 1974. The second stage covered the building of the assembly hall, the gym, the library and the museum that saw their ceremonial opening in 1976. In the meantime, in 1973, the Student Hostel – which was named after József Marek – was also completed. It was opened and rendered ceremonially at the students' disposal by Pál Romány, Minister of Agriculture. Parallel to these efforts, the *University Library* was also being reconstructed and supplied with state-of-the-art information technology equipment. The library was opened in 1984, together with the recently installed Veterinary History Collection. The 'József Marek Commemorative Plaque' was founded in 1975 and first donated to József Marek's worthy successor, Academician János Mócsy.

During his second period in the Rector's office (1983–1990), Kovács Ferenc had the following subjects on the top of his list: making preparations for the 200-year anniversary of the foundation of the University, preparing future Heads of Department on an international standard; making preparations, along 'diplomatic' channels, for German-language training to be provided for West German citizens (1986–1987); acquiring international recognition of equivalence for the Hungarian university diploma; launching training in German language; and creating the material conditions for enhancing the tool-kit to serve the end of international relations in education and research.

As one of the most remarkable achievements of his Rector's career, he organised the bicentennial ceremonies of the University of Veterinary Science. This series of events was attended by representatives from 40 partner institutions from the world over as well as from the majority of Hungarian vocational educational institutions. Just to mention a few prominent foreign delegates that added to the lustre of the events: The President of the World Veterinary Association, the representative of the world's first veterinary educational institution, the National Veterinary College of Lyon, and the Counsellor of the United States Department of Agriculture. Many notabilities of the Hungarian social, economic and cultural spheres paid their respects, like the President of the Presidential Council, the delegate of the Government, the Ministers of Agriculture and Food, Health and Culture, the Vice-President of the Hungarian Academy of Sciences, and the Chairman of the Budapest Municipal Council. We hardly exaggerate when saying that that week -25-29 May 1987 - put Budapest on the map for the world's veterinary public. A plethora of publications chanted the praises of the bicentennial ceremonies, and the spirit of these events opened up new gates to the world. It was in the wake of these events that German-language veterinary training saw its beginning in 1988, which was furthered also by the fact that the European countries – after extensive diplomatic efforts – recognised the Hungarian veterinary diploma as equivalent with theirs. Training in German made the bed for a similar English-language training to follow suit a few years later, which - coupled with the former – has raised remarkable interest and enhanced the reputation of our institution up to the present day.

The central and the four satellite events held in May 1987 (among them the congresses of the European Association of Veterinary Anatomists and World Association for the History of Veterinary Medicine) did not just give a worthy representation of our institution, but raised Hungary's reputation, as well. Tied to the jubilee, the following volumes were published: 'Bicentenary of Veterinary Education in Hungary', 'Bicentennial Ceremonies and School Years of the Veterinary University', and 'Bibliography, Biography of our Deceased Professors and Predecessors (1787–1987)'. As for the satellite events, mention must be made of the memorial session of parasitology and the unveiling of Kotlán's statue on the occasion of the Kotlán centenary; the pathology memorial session and statue unveiling organised on the occasion of the *Jármai* centenary, the opening ceremony of the 30th Agricultural Book Month, the unveiling of the memorial plaque with the names of Olympic, European and World Champions having graduated from our University, and the unveiling of the Hungarian Grey bull's bronze statue as a symbol of the epoch when our Alma Mater was founded.

Still with Ferenc Kovács in control, the physical conditions of research and education and international contacts were enhanced through the acquisition of the *Experimental Institute* in Üllő, the National Equine Training Centre – the Tattersall, the Experimental Plant in Agárd, and the Guesthouse in Abonyi Street. Opened by Csaba Hüttner, Minister for Agriculture in 1989, the Central Laboratory, equipped with state-of-the-art instruments and established for feed analysis and metabolic tests in animals, was also a blossom of a major development project at 50 Rottenbiller Street. It was about this time when the memorial plaque – In Memorian Martirum Veterinariorum Disciplorumque MCMXXXIX–MCMLVI – hanging on the wall of the Department of Pharmacology was completed; we bow our heads to it every Heroes' Day. In connection with his executive role Ferenc Kovács published 26 papers discussing issues of science policy.

In 1990, during his time as Vice-President of the Section of Agricultural Sciences, upon the invitation of Academician and Rector Péter Horn, Ferenc Kovács joined the Kaposvár Faculty of Pannon Agricultural University in the position of research professor. He was more than happy to accept the invitation as he had been an external consultant of the legal predecessor institution for three decades ever since its foundation; even at that early date the necessity of co-operation between people involved with animal breeding and the veterinary sciences become absolutely obvious. He was in charge of the research group sponsored by the National Scientific Research Fund (OTKA) and the Hungarian Academy of Sciences in Kaposvár until 1996, and he can still call himself the spiritual leader thereof. The working team's statements of outstanding international importance include the exploration of the details of interrelations in the context of soil-plant-animal-human food chain, with special regard to food quality and safety and to the safeguarding of public health. They were the first to furnish evidence for the kinetics of mycotoxins produced by certain Fusarium moulds right from the soil to the first food given to infants, i.e. breast-milk, and to explore the options of accumulation in the organism as well as the pathophysiological changes caused.

In co-operation with the Diagnostic Institute of Kaposvár University, by means of computed tomographic (CT) and magnetic resonance imaging (MRI) procedures they were the first to demonstrate the fetotoxic effect of fumonisin mycotoxins and the path-ophysiological changes caused by low-dose long-term (chronic) and high-dose but short-term exposure. The researchers defined the smallest toxin quantity still tolerated by the pig's organism.

In this subject and under his control, an interstate treaty-based joint research is in progress between the Medical University of Natal in the Republic of South Africa and

the EU mycotoxin reference laboratories operating at the Agricultural Faculty of Munich University.

This research group was later taken over and led for fifteen years by Péter Horn. Professor Ferenc Kovács is an active member of the Doctoral Council of Kaposvár University up to the present day, and is heading the Council of the Doctoral School for Animal Breeding Sciences.

He was elected member of the Hungarian Academy of Sciences in 1976. He was a senior executive of the Section of Agricultural Sciences of the Hungarian Academy of Sciences over a period of nine years. He worked as Vice-President of the Section in the period between 1990 and 1996.

In his position of *Section President* (1996–1999) he followed *József Marek*, who had been the first president of the Section founded in 1949, and *János Mócsy, Secretary of the Section*. Upon his proposal, and with him as the author of some chapters, editor and responsible publisher, the volume entitled '50 Years of the Section of Agricultural Sciences of the Hungarian Academy of Sciences (1949–1999)' was published in 1999.

His six decades' work is hallmarked by more than 30 textbooks, manuals, book chapters and book-like scientific publications, hundreds of Hungarian and foreign-language scientific papers, and presentations held at international forums. Two academicians, three Doctors of the Hungarian Academy of Sciences, twelve holders of candidate's and PhD degrees, and seven professors serve as shining proof for the success of his school.

His work in Hungary and abroad was recognised by three foreign (Hanover, Vienna, Košice) and three Hungarian universities (University of Veterinary Science, Pannon Agricultural University and the University of West Hungary) by awarding him the Honoris Causa diploma. His native village (Somogyszentpál) awarded him honorary citizenship.

He used to hold, and is still holding, some significant scientific and social offices. He is honorary member of the German Veterinary Society, the International Society of Biometeorology and foreign member of the Russian Academy of Agricultural Sciences.

His outstanding lecturer's, researcher's and executive's work was recognised by a great number of diplomas of merit, of which the most significant ones are as follow:

Academy Prize (1972, 1978)

Ferenc Hutÿra Memorial Plaque (1972)

Lóránd Eötvös Prize (1974)

János Mócsy Memorial Plaque (1975)

József Marek Memorial Plaque (1979)

State Prize (1983)

Commander's Cross of the Hungarian Republic (1996)

Memorial Plaque of the Hungarian Society for Animal Hygiene and Environmental Protection (1999)

Honorary Citizen of Somogyszentpál (2001)

Ferenc Hutÿra Memorial Plaque (2006)

Honorary President of the International Society for Animal Hygiene (2011)

Commander's Cross with the Star of the Hungarian Republic (2012)