



Professor Jan Kowalczyk on the 50th anniversary of his professional career and 70th birthday

Professor Jan Kowalczyk was born on May 31, 1931 to Stanisław and Bronisława, née Węclaw, in Bondyż near Zamość. After graduating from middle school in Zamość and the Technological and Chemical High School in Lublin, he studied chemistry at the Department of Mathematics, Physics, and Chemistry of the Maria Curie-Skłodowska University (UMCS) in Lublin. He worked as a laboratory technician at the University and as a high school teacher in Lublin until graduating with a master's degree in chemistry in 1955. After working for several years as an assistant at the Chair of Inorganic Chemistry of UMCS, Jan Kowalczyk accepted a position at the Agricultural University under the direction of a well-known specialist in physiological chemistry, Professor Józef Skulmowski.

In 1961 he began work at the Institute of Animal Physiology and Nutrition of the Polish Academy of Sciences in Jabłonna as the head of the Chemical Laboratory, bringing with him much innovation in equipping the laboratory and implementing indispensable analytical methods. Next, he became head of the Ruminant Nitrogen Metabolism Laboratory, and has headed Department of Ruminant Physiology and Nutrition since 1991.

Professor Kowalczyk's scientific interests have focused on the various aspects of nitrogen and carbohydrate metabolism in the rumen and their digestion and absorption in the more distal parts of the digestive tract. For example, during his 1968-1970 stay at the Institute of Animal Production in Havana, Cuba, Professor

Kowalczyk studied nitrogen and carbohydrate metabolism in cattle fed a diet based on molasses and urea. These studies discovered why the animals tolerated large doses of sugar and urea in the diet without signs of toxicity. The specifics of processes occurring in the rumen leading to the formation of large amounts of caproic acid were demonstrated. The optimal ratio of urea to molasses (nitrogen to energy) in the ration guaranteeing maximum microbial protein synthesis was calculated. These results were confirmed by other authors and have been widely cited in the world literature.

The results of these very interesting studies were presented by Jan Kowalczyk in his doctoral thesis entitled "The metabolism of nitrogen and carbohydrate in the rumen and abomasum of young bulls fed diets based on molasses and urea" presented in 1971.

Continuing studies on the use of urea as a source of nitrogen for ruminants, Jan Kowalczyk showed that in young bulls, the amount of amino acids flowing through the duodenum did not change if urea accounted for up to 40% of the nitrogen in the ration. Using urea labeled with ^{15}N , he showed that urea nitrogen is incorporated into amino acids of bacterial proteins to various degrees: the least is found in aromatic and sulphur-containing amino acids, the most in glutamic and aspartic acids, and lysine. In these studies, conducted together with the Institute of Animal Physiology in Košice (Slovakia), it was also shown that 60-80% of intravenously administered ^{15}N -labelled urea was later found in the rumen.

In other studies on the metabolism of nitrogen in the rumen conducted together with Dr. E.R. Ørskov and Dr. J.J. Robinson at the Rowett Research Institute in Scotland in 1973-75, Professor Kowalczyk showed that a fat level exceeding 5% in the diet has an adverse effect on feed intake and ruminal processes. This is one of the first studies ever to point to this problem.

Concomitantly with his work on the physiology and biochemistry of non-protein nitrogen metabolism in the rumen, Professor Jan Kowalczyk was involved in other studies related to applications, especially of preparations enriched in urea and their use in practice in feeding cattle and sheep.

In parallel with his work on the use of non-protein nitrogen in the nutrition of ruminants, Professor Kowalczyk worked on a key problem at the time, i.e., protection of feed protein from deamination in the rumen. He showed that protection of protein by treatment with formaldehyde decreases deamination in the rumen, but worsens its digestibility in the further parts of the digestive tract, decreasing the nutritive value of treated protein.

Jan Kowalczyk presented the results of studies on the protection of protein from degradation in the rumen in his thesis for the degree of doctor habilitated, which he was awarded in 1992. Shortly thereafter, in 1994, in recognition for his scientific, educational and organizational achievements, Jan Kowalczyk was awarded the title of professor of agricultural science.

The problem that Prof. Kowalczyk has been working on intensively in recent years is the secretion and absorption of endogenous nitrogen compounds in the digestive tract of sheep. He has used a unique method in these studies: temporarily isolated intestinal loops and a method of collecting and exchanging ^{15}N -labelled and unlabelled digesta from various sections of the digestive tract. These studies, conducted in cooperation with Dr. K. Krawielitzki and Dr. J. Voigt from Oskar Kellner Institute and the University of Rostock, have made it possible to quantitate the secretion, reabsorption, utilization, and loss of endogenous nitrogen in growing sheep and in pigs.

With his thorough background in chemistry, Professor Jan Kowalczyk has proved himself to be an exceptionally talented analytical chemist. Together with his team he has been working on new analytical methods of determining indicators of rumen microbial protein synthesis, on the separation, identification, and quantitation of fatty acid isomers and other compounds using HPLC. Some of these methods, published among others in the *Journal of Chromatography*, have come into wide use in the study of the physiological and biochemical processes in animals.

The subject matter investigated by Professor Kowalczyk has been and still is inspiring for a large number of young scientists working both at the Institute in Jabłonna and elsewhere, who worked under his supervision or prepared their doctoral theses under his direction.

Professor Jan Kowalczyk is the author of over 300 publications, including original papers, reviews, short papers and other positions.

Professor Kowalczyk is well known in the scientific community. He collaborates with numerous research centres worldwide, including the Rowett Research Institute in Scotland, the Agricultural Research Centre, Jokioinen, and the Department of Animal Science in Helsinki, the Oskar Kellner Institute of Animal Nutrition, Rostock (Germany), Institute of Animal Nutrition, Košice (Slovakia), and many others.

An expression of the acknowledgement of the scientific achievements of Jan Kowalczyk are four awards for research from the Polish Academy of Science, the M. Oczapowski science award for a monograph, and the international award of the Polish Academy of Sciences and the Czechoslovakian Academy of Science for the distinguished results of the collaborative scientific program, "Studies on the physiology and biology of processes related to the utilization of nitrogen".

Professor Jan Kowalczyk was awarded the Gold Cross of Merit for the body of his work.

Professor Jan Kowalczyk has unquestioned achievements in the field of editing. He has been the editor-in-chief of the *Journal of Animal and Feed Sciences* since 1992. Thanks to his talent and commitment, JAFS has become a highly regarded international journal, which Current Contents Agric. Biol. and Environ. Sci. and many other databases have quickly begun to index.

Professor Kowalczyk is also a member of the editorial boards of international scientific journals: The International Journal of Feed Science and Technology (Amsterdam), Egyptian Journal of Nutrition and Feeds (Cairo), Archives of Animal Nutrition (Berlin), Acta Fytotechnica et Zootechnica (Nitra), and Animal Biology (Lvov), where he is appreciated for his insightful and objective reviews.

When writing about Professor Jan Kowalczyk, the atmosphere of his family home, deeply patriotic and sensitive to the needs of others, must be mentioned. The years of the Nazi occupation of Poland cannot be disregarded, since as a young teenager, he fought in the Home Army in the Zamość region, for which he received many high decorations, including the Partisan Cross and the Home Army Cross.

During his studies and in the early years of his professional career, mountain climbing in the Tatra Mountains and Alps were one of Jan Kowalczyk's favourite pastimes. His friends from those years still remember him as a prudent and talented climber and organizer of mountain-climbing expeditions.

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