

## Foreword

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Professor Kalle Majjala is an eminent scientist in animal breeding with distinguished research career spanning from the mid-1950's to retirement in 1990 – and in many respect until present – reflected in over 600 articles ranging from scientific to applied subjects. Animal breeding is concerned with the analysis of variability in complex traits that are caused by several genes as well as non-genetic factors. Most traits of economic importance are of this type. Molecular genetics has opened new pastures and fields to animal breeding and its solid base quantitative genetics due to genetic mapping technology and the advent of whole genome sequences. This development is critically dependent on the foundation of knowledge laid down by Kalle's generation of animal breeders and quantitative geneticists.

Understanding quantitative variability involves a combination of data collection from the farms, selection experiments, statistical analysis and mathematical modelling of genes and their effects in populations together and the environmental factors. Kalle has had a major influence on the fruitful development of these research areas in Finland. In addition to his purely scientific work, he has made many important contributions through application of research findings to animal improvement. These have had a lasting impact in the Finnish animal breeding industry. He has received both a breeding and artificial insemination organisation award in recognition of his work.

Much of Kalle's work has been data analyses, using statistical tools in estimating the genetic parameters of quantitative traits in livestock populations for the purpose of designing improvement programmes for economically important traits. Of especial importance has been his thesis work on fertility traits in dairy cattle. This seminal study had challenges in finding good data, appropriate statistical methods and sufficient computing capacity. His pioneering actions in purchasing bigger and new types of computer technology are legendary within MTT.

Kalle has made some very influential contributions to our understanding of breeding objectives. He laid down in 1976 a useful framework for analysing the long-term goals for animal breeding. The analysis was founded on potential for feed production and demand to satisfy the basic nutritional demands of consumers. He considered '*biological efficiency – especially in protein production – as the main aim in animal production*' and raised doubts about the use of often uncertain economic factors in long-term analyses. Thus, 'milk production is the most effective way of producing animal protein', mainly due to the ability to convert grass to milk protein. The work also clearly showed the caveats in the efficiency of the supply chain of animal products. Such ideas lent themselves to constructing selection profiles in all the Finnish livestock species.

Kalle has not hesitated to get involved. His coffee break chatting in Edinburgh triggered worldwide interest in the prolific Finnsheep. His worry about losing native Finnish cattle breeds took him quickly to European, Nordic and Finnish committees on genetic diversity of farm animal species, well before the

awareness of related risks in selection programmes for the main stream breeds. Kalle is a strong supporter of high milk consumption and actively follows the achievements in milk fat research. His participation in the Finnish Workhorse society closes the circle set in childhood by his father's keen interest on horse breeding. Kalle's latest duty is defending pig producers' views on breeding policies against the conflicting interest of industry maximising its short-term profits.

He has always had clear views on research policies and an ability to express his thoughts in comprehensive text, compressing the premises, analyses, associations and conclusions in one sentence. In hindsight, we now understand why Kalle in the late 1970's was so reluctant to move the flourishing animal breeding research away from the neighbourhood of research and industry partners. As a result the research group was left to stray and it took some years until the output matched with the earlier accomplishments.

A certain feature in Kalle's approach to science has been that of a scholar. Starting from a concrete topic, he has collected earlier findings, ordered and boiled them down to few key issues. As an outcome, he has produced extensive reviews on heritabilities and correlations in dairy cattle, possibilities to improve fertility traits, Finnsheep, genetic diversity and properties of dairy milk components.

Kalle started his career in the Finnish Ayrshire Society in 1954 and moved to MTT Agrifood Research Finland (previously known as Agricultural Research Centre of Finland) in the following year. There was another spell (1961-63) in the industry as the general manager of the Association of AI Societies. While in research, he has served with distinction in the professorship at MTT (1968-76 and 1980-87), at the University of Helsinki (1976-80) and at the Academy of Finland (1987-90).

Since his formal retirement at the age of 63, he has continued an active role in research and discussions on animal breeding and related fields. Kalle has by no means retired. I recall a few years back a visit to Kirsti and Kalle at their summer cottage at Sahalahti, close to Kalle's childhood district. When I got up quite early in the morning, I found him sitting on the lawn swing surrounded by heaps of papers on which he had been brooding for quite some time. Most likely these were articles on milk fatty acids, his favourite topic at that time.

Kalle's father in science is Ivar Johansson, professor of animal breeding in Uppsala in 1933-58. Johansson was a very important figure in finding the research talents in Kalle and guiding him to science and then introducing him to the best research groups, such as Iowa and Edinburgh. Young animal breeders are counting how many generations there are between them and professor Jay L Lush. Kalle is Lush's son as he paid a four month visit to Iowa in 1960-61. Other important foreign colleagues have been Jan Rendel of Uppsala and FAO and Harald Skjervold of Ås. These contacts and the good quality of the collaborative research generated many international duties of which the most important ones have been the work in Nordic organisations, and the presidency of the Genetics Commission and chairmanship of the working group for animal genetic resources at EAAP.

We at animal breeding and genetics research of MTT felt it appropriate to celebrate Kalle's 80<sup>th</sup> birthday by bringing together a set of papers from his former colleagues and junior scientists in the field. Some of these papers have a link to Kalle's type of work, some are on the outskirts of the relationship matrix and show how the seeds have fallen on a fertile soil. The editorial work has been done by Sari Torkko. With this special issue we would like to thank Kalle for setting us such a scene and culture to work in and congratulate him on his 80<sup>th</sup> birthday.

We wish Kirsti and Kalle all the warm moments and days with family and friends – sometimes filled with pleasant recollections of the past.