

## Foreword

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This special issue of Agricultural and Food Science is dedicated to the 100th anniversary of the Faculty of Agriculture and Forestry at the University of Helsinki. In fact, this 100th anniversary is based on the start of forestry education at the university level in Finland in 1908, although some disciplines in agricultural sciences already started in the late 19th century at the University of Helsinki. The Faculty of Agriculture and Forestry as such was officially established in 1924.

The need for research in the agricultural and food sciences has always been enormous and important; after all, they deal with the basic needs of human life. During the last decades, however, there was a slight downward trend as there was talk of the so-called sunset sector in the media and society in general. Suddenly and quite unexpectedly, the situation has changed dramatically during the last two years. The ongoing global food crisis has surprised many with its intensity, scale, and scope. Its long-term background factors include climate change and the increased demand for, primarily animal-based, foodstuffs brought on by rapid economic development in Asia. The increased use of bioenergy and the rising price and depleting reserves of oil are both short- and long-term factors. The short-term factor is mostly a result of political bioenergy decisions in both the European Union and the United States. Other factors which are short-term, but which may occur with increasing frequency due to the change in climate, include crop failures as well as speculators hunting for quick profits in the global food market's inflated prices. We also need to remember that worldwide close to one billion people are suffering from malnutrition even today.

Climate change is both a challenge and a potential opportunity for Finnish agriculture. There seems to be a chance that a warmer climate will result in higher yields and better productivity, but new pests and plant diseases may simultaneously threaten the agri-food industry. Moreover, environmental requirements and goals have already become very crucial and constraining for agricultural and aquacultural production, and they will remain so in the future, too. Finland's EU accession in 1995 already showed Finns the significance, impacts, challenges, and problems of international trade, but especially recent years have taught them that when raw materials are scarce, international trade plays a key role.

On the other hand, while we are battling the food crisis, high prices, malnutrition, and poverty on our planet, we must also deal with the problems of obesity, eating disorders, and other food-related health problems, including especially food safety in general. Health concerns have increased, and so-called functional food products have consequently gained a bigger role in our lives. In response to both changing consumer

preferences and climate change and energy issues, the market for organic and local food is predicted to grow faster than so far. It is unclear which of these represent permanent trends and which are passing phenomena waiting to be replaced by others in the typical cycles of trends, fashions, and life styles.

The challenges for the fields of the Faculty of Agriculture and Forestry are extensive and have long-term impacts. It is possible to turn these challenges into opportunities, and indeed we must. The faculty's founding principle is high-quality research, which also provides the foundation for excellence in teaching. The faculty's high quality has been proven in many ways by international comparisons and rankings. There is of course always room for improvement. Our additional strengths include our multidisciplinary nature and the fertile and extensive co-operation between our faculty and sectoral research institutions. We can face the multidisciplinary and complex challenges of the future by taking advantage of our faculty's unique combination of basic and biological sciences, economics and technology, and of how high-quality research forms the cornerstone of our teaching.

To open this special issue, and to represent the economics and policy areas of our faculty, Ollikainen et al. assess the policy-related transaction costs of agricultural and agri-environmental policies in Finland. They find that the transaction costs of Finland's agri-environmental programme have increased with more targeted and differentiated agri-environmental measures.

Concerning technological issues, which are also important for attempts to improve the competitiveness and quality of Finnish farming, new and traditional surface materials in cattle barns are analysed both under laboratory conditions and in practice. The field study confirms the laboratory observation that plastic coatings improve the cleanability of concrete cattle barn surfaces.

The currently very important and interesting issue of bioenergy has been dealt with by Tuomisto and Helenius in a comparison of energy and greenhouse gas balances of biogas with other transport biofuel options based on domestic agricultural biomass in Finland. The environmental impacts and problems of agriculture are analysed by Soinne et al., who examine the effects of urine and dung additions on the phosphorus chemistry of pasture land and compare the sensitivity of two soil extraction methods in assessing the P-loading risk. Simojoki et al. analyse the intensification of mechanical agriculture and its impacts on soil quality in their study of macro- and micro-scale gaseous diffusion in a Stagnic Luvisol as affected by compaction and reduced tillage.

In two comprehensive review articles, Mäkelä et al. and Elomaa et al. look at crop plant production and breeding both in terms of past developments and future possibilities, including plant biotechnology. Traditionally, potato was long a key staple on Finnish tables, but nowadays it competes with, e.g., rice and pasta. As one way to improve the potato's competitiveness, Turakainen et al. investigate the effect of selenium enrichment on the growth of sprouts and the growth vigour of seed potatoes.

These ten articles are a good way to illustrate our 100-year-old faculty's research. They are however only a sample of our extensive, multidisciplinary, and multifunctional research that has had and will continue to have an important impact on and provide input into Finnish society as a whole. The Faculty of Agriculture and Forestry wants to be an integral and invaluable part of the development and future success of the Finnish agricultural and food sector. Our mission is strong, appropriate, and highly meaningful in these changing times; the Faculty of Agriculture and Forestry promotes the sustainable use of natural resources and human well-being through top-level scientific research and teaching. I would like to emphasise the "human well-being" element of our mission. We know why we are working in a sustainable way.

The Faculty of Agriculture and Forestry wants to thank the AFS journal for the important and useful opportunity to have this special issue present our versatile, high-quality research in agricultural and food sciences.