

Preface

Aila Vanhatalo

Guest Editor

Department of Agricultural Sciences, University of Helsinki

e-mail: aila.vanhatalo@helsinki.fi

The XVI International Silage Conference (ISC) was held in Hämeenlinna, Finland, 2-4 July 2012. Ever since the first ISC took place in Edinburgh, Scotland, UK, in 1970, this conference has been held in every two to four years. For the first twenty years the series of conferences took place in the UK, but since the conference held in Dublin, Ireland, in 1993, it has also been organized by other countries such as Sweden (Uppsala 1999) and USA (Madison 2009). A total of 320 delegates from around 40 countries attended the XVI ISC in Finland demonstrating that silage indeed is an important issue worldwide.

The programme of the silage conferences has traditionally covered all core topics of developments in silage science and technology. It has also been customary to document invited and volunteered presentations as abstracts or more extended papers in the Proceedings volume. This was also the practise in the XVI ISC held in Finland last year. However, with a high hope that the best offerings of the conference would be thoroughly documented for future use the authors of the XVI ISC were invited to contribute to a peer-reviewed Special issue of Agricultural and Food Science (AFS) to be published in due course after the conference. Now it is a pleasure to announce that our call was very positively responded by the contributors of the ISC and resulted in this AFS Special issue totalling seventeen papers, which comprise six review articles, seven full papers and four research notes.

The Special issue begins with a review of Richard Muck focusing on recent advances in silage microbiology. He points out how the new techniques available in silage microbiology helps us to gain better understanding of silage microbiology and allow us to better manage ensiling process and develop better additives. Silage is, however, a potential source of microbiological and chemical contaminants in the dairy chain. Therefore, the paper on silage microbiology is followed by a comprehensive review of Frank Driehuis summarizing current knowledge about silage and the safety and quality of dairy foods. The full papers and research notes concerning this topic deal with research issues such as mode of action of inoculants or efficacy of inoculants on herbage of various plant species ensiled in various conditions. Aerobic stability is one of the key words common to almost all of these papers emphasising the importance of efforts to improve aerobic stability of silages made of various forage crops. Some of these papers seek for methods for quantifying and controlling dry matter and nutrient losses from silos during and after the ensiling period.

Silage has been an invaluable innovation especially in the dairy cow feeding in Northern areas such as Finland, where grazing period of cows is very short and winter period indoors long. Pekka Huhtanen et al. reviewed silage research made in Finland starting from the Nobel Prize winner A.I. Virtanen, who showed the importance of low pH and inhibition of plant and microbial enzymes in silage preservation already 80 years ago. The thorough paper of Huhtanen et al. reviews more recent achievements of the Finnish silage research with the special emphasis on ensiling, feed evaluation, feed intake and milk production. Richard Dewhurst in his review extends the topic of milk production from grass silage to other ensiled forages especially to legume and maize silages and their mixtures in dairy cow feeding. He predicts that mixtures of maize and legume silages relative to grass silage in dairy cow rations may have potential to reduce both N and methane emissions without loss of milk production. Tim Keady et al. focuses on the factors affecting the utilization of ensiled forages by beef cattle, dairy cows, pregnant ewes and finishing lambs in their review paper, which summarizes data on research conducted in this field in Ireland and UK during recent 30 years.

The research articles focusing on animal production cover various aspects of feeding silage to different species of animals. Pesonen et al. investigated the effects of concentrate supplementation on the product quality of beef bulls fed grass silage-barley based diets. Gerlach et al. conducted an interesting study to monitor how changes in maize silage fermentation products during aerobic deterioration affects preferences of goats in terms of silage dry matter intake. Sarria and Martens showed that silages made from some legume forages available in tropics have potential to serve as feed supplement in pig diets. This is an interesting finding demonstrating that ensiling technology may be applied to local feed resources and utilized also in feeding of monogastrics.

The review by Tom Misselbrook et al. compiles topical research on opportunities for reducing environmental emissions from forage-based dairy farms. While there is a need to increase animal production to meet increasing global demand, it is fundamental to minimize inevitable environmental emissions. These authors review the sources and impacts of emissions to atmosphere and water in the context of a forage-based dairy farms considering potential mitigation strategies and giving also examples using a farm-scale modelling approach. They show that much can be achieved with systematic improvements in the efficiency of production in dairy systems including for instance means such as improvements in dairy herd fertility, dietary modifications, use of nitrification inhibitors with fertiliser and slurry applications as well as through attention to the quantity, timing and method of application of nutrients to forage crops.

This Special issue includes seventeen scientific papers, of which a few were briefly introduced here to highlight its leading themes. As a chair of the scientific committee of the XVI ISC I wish to thank all the authors and contributors as well as the Editorial board of the Journal for making this Special issue possible. Especially, the invaluable work of Dr. Kaisa Kuoppala from MTT Agrifood Research Finland and Dr. Seija Jaakkola from University of Helsinki in various stages of this Special issue is greatly appreciated. It is probably not an overstatement to say that silage is needed more than ever today. Silage made of a wide range of plant species and various plant by-products is increasingly used for ruminant production animals worldwide, but it is important to note that silage may also have increasing potential in feeding of monogastrics in future. I hope that this Special issue of AFS will be a tool and an inspiration for future progress in the field of silage science and technology.