Food Preservation and Sustainability at Home - Future Opportunities for Consumers to Reduce Food Waste

Thursday, 14 April 2016, 9.30 am, University of Veterinary Medicine Hanover
Agenda of the 10th Cofresco Forum Round Table

I. 9.30 Reception, registration

II. 10.30 – 10.40 Welcome by Dr Dr h. c. mult. Gerhard Greif, President of the University of Veterinary Medicine Hanover

III. 10.40 – 10.50 Introduction to the topic by Martin Rogall, Cofresco Forum

IV. 10.50 – 11.00 Laudatio Cofresco Forum, Prof Dr Horst Christian Langowski, Fraunhofer IVV

V. 11.00 – 11.30 Risks and benefits of silver and silver compounds for films in contact with foodstuffs with regard to hygiene and the properties of packed pork, beef and poultry, Prof C. Kehrenberg, Dr Carsten Krischek, University of Veterinary Medicine Hanover

VI. 11.30 – 12.00 Modified Atmosphere and Humidity Packaging of Fresh Produce, Dr Pramod V. Mahajan, Leibniz Institut für Agrartechnik Potsdam-Bornim e.V.

VII. 12.00 – 12.30 Consumer behaviour and its impact on food quality and safety, Dr.ir. LPA Bea Steenbekkers, Wageningen UR (Netherlands)

VIII. 12.30 – 13.30 Break and snack

IX. 13.30 – 14.00 Using cold plasma to combat noroviruses, Dr Birte Ahlfeld, University of Veterinary Medicine Hanover

X. 14.00 – 14.30 Overview of packaging trends, Dominique Huret, Cape Decision (Belgium)

XI. 14.30 – 14.40 Summary and outlook, Martin Rogall, Cofresco Forum

XII. 14.40 – 15.15 Discussion/break

XIII. 15.15 – 17.00 Practical sessions RIZ

XIV. 17.00 Buffet/ get-together

Chairperson: Dr Ulphard Thoden van Velzen, Wageningen UR (Netherlands)
Chairperson

Dr Ulphard Thoden van Velzen
Wageningen UR (Netherlands)

Curriculum Vitae
Dr Ulphard Thoden van Velzen studied Chemistry at the Universiteit Utrecht and obtained a PD there. He then moved on to the Universiteit Twente to work there as a PhD student in organic chemistry. In 1994 he completed his thesis on “Self-assembled monolayers of receptor adsorbates on gold; preparation, characterization, and application”.

After a post-doctoral fellowship at a predecessor of Ambri Ltd (AUS) he started working as a senior packaging technology researcher at FBR in Wageningen (NL). Ulphard’s focus is on executing contract research for packaging companies and FMCG companies using packages. Besides troubleshooting and consultancy, most focus is on developing and implementing:

- Packaging solutions for fresh foods, mostly MA and active packages for fresh foods (fruit, vegetables, meat and meals)
- Sustainable packages (biobased and recycled)
Recent publications

Feil A. Thoden van Velzen EU Jansen M. Vitz P. Go N. Pretz T. 2016 “Technical assessment of processing plants as exemplified by the sorting of beverage cartons from lightweight packaging wastes” Waste Management 48, 95–105


Laudator

Prof Dr Horst-Christian Langowski
Fraunhofer Institute for Process Engineering and Packaging IVV, Freising

Curriculum Vitae
1973 – 1980 Studied physics at the University of Hanover, Germany
1981 – 1991 Development engineer and project manager in the sector of optical data storage (CD, CD-ROM, CD-R) for a company of the Philips Group
1985 – 1989 Parallel: doctoral thesis at the University of Hanover, German degree: Dr rer. nat.
1991 Scientist at the Fraunhofer-Institute for Process Engineering and Packaging IVV, Freising
1992 Head of Department at the Fraunhofer Institute for Process Engineering and Packaging IVV, Freising
2003 Professorship at TU Munich, Chair of Food Packaging Technology
2004 Acting Director of the Fraunhofer Institute for Process Engineering and Packaging IVV, Freising
2006 Study Dean of the School of Brewing and Food Technology
2007 Director of the Fraunhofer Institute for Process Engineering and Packaging IVV, Freising

Additional Functions:
- Executive Committee of the European Metallizers Association
- Board member of the Bavarian State Brewery Weihenstephan
- Member of the Advisory Committee Extrusion Technology within the VDI, group plastics technology

Publications:
http://publica.fraunhofer.de/jsp/StarXmlQuery?style=list.xsl&inst=ivv&author=Langowski,+H*
“Risks and benefits of silver and silver compounds for films in contact with foodstuffs with regard to hygiene and the properties of packed pork, beef and poultry”

Prof. C. Kehrenberg, Dr. Carsten Krischek
University of Veterinary Medicine Hanover

Curriculum Vitae
Prof. Dr. med. vet. Corinna Kehrenberg, PhD works at the Institute of Food Quality and Food Safety at the University of Veterinary Medicine Hanover, Foundation, Hanover/Germany, where she currently heads the working group Molecular Biology. Her research interest is molecular microbiology, with most of her published work focusing on mechanisms of antimicrobial resistance in zoonotic pathogens, the epidemiology of resistance, surveillance of antimicrobial resistance and methods of rapid and molecular diagnostics. She is a member of the working group “Antimicrobial Resistance” of the “German Veterinary Medical Society (DVG)”.

Abstract
The antimicrobial properties of silver and its compounds have been known for centuries. However, in recent years, silver has not only been used in medical settings (wound dressings, medical devices), but also for many industrial applications (textile and hygiene products, surface coatings). As an antimicrobial mechanism, the release of silver ions into aqueous solutions and the generation of reactive oxygen species, which may interact with bacterial enzymes and proteins, is assumed. To improve hygiene in the food industry, potential uses of nanotechnology have been identified. Here, we report the risks and benefits of a nanosilver coated layer for packaging of meat. In an initial investigation, the antimicrobial susceptibility of important bacterial food pathogens to silver salts and further biocides was determined by broth microdilution. In a second study, meat of different species (broiler, turkey, pig, cattle) was stored for up to 12 (not beef) or 16 days (beef) either in modified atmosphere packages, or under vacuum with and without the nanosilver coated layer. At different days during storage the microbiological and physico-chemical properties of the products were analysed. The data were statistically analysed and will be partly presented during the talk.
“Modified Atmosphere and Humidity Packaging of Fresh Produce”

Dr. Pramod V. Mahajan
Leibniz Institut für Agrartechnik Potsdam-Bornim e.V.

Curriculum Vitae
Pramod Mahajan is Senior Scientist in the Horticultural Engineering Department at ATB: A European centre of Agricultural Engineering Research at the nexus between biological and technical systems. He graduated with B. Tech (Agricultural Engineering) and later M. Tech and PhD (Postharvest and Food Engineering) from IIT Kharagpur India. He worked at University College Cork, Ireland for nearly 11 years before moving to ATB Potsdam in 2014. At ATB, he is currently group leader for packaging and storage technology of horticultural crops. His current research is on Modified Atmosphere Packaging (MAP), Controlled Atmosphere (CA) storage systems, bio-based packaging solutions, photo-catalytic oxidation of ethylene, humidity-regulating trays, and applications of non-invasive sensors in fresh produce packaging and storage. His research results are well documented in over 50 original scientific papers published in international peer-reviewed journals. Over the years of experience, he has developed a strong competency in packaging of fresh produce with an approach of mathematical modelling to provide solutions to the complex problems.

Abstract
Fresh produce is unique among food products; it remains metabolically active and its shelf life is shortened as a consequence of these processes. Appropriate packaging is one of the essential methods for protecting and maintaining the quality and prolonging the shelf life of produce from growers to consumers. Current MAP design considers the respiratory gas exchange of produce as the only important parameter for deciding target gas barrier properties required to achieve equilibrium package atmosphere. However, besides in-package gas composition, it is also important to take into consideration the in-package level of humidity in order to avoid condensation and/or mould and bacterial development in MAP systems. It is well known that the in-package
humidity is influenced by respiration and transpiration of the fresh produce as well as the water vapour permeability of the packaging material. However, most polymeric materials (polyethylene, polypropylene or polyvinyl chloride) used in packaging have lower water vapour permeability relative to transpiration rates of fresh produce; therefore, most water molecules evaporated from the produce do not escape through the film and remain within the package, enhancing the water vapour pressure in the package microenvironment. Under these near-saturation conditions, even minor temperature fluctuations may result in condensation inside the package resulting in produce sliminess and enhancement of microbial growth and decay of produce. Therefore, a major challenge of modified atmosphere and humidity packaging (MAHP) is to find a solution for creating an optimal atmosphere and reducing the risk of water condensation in the package while still keeping produce weight loss as low as possible. A recent development of integrating salt into the polymer matrix of the packaging tray provides a novel approach to regulating in-package humidity for fresh produce. Furthermore, a mathematical model based on knowledge of product respiration and transpiration allows the optimisation of a package system for maintaining the original quality of fresh produce for longer periods.
“Consumer behaviour and its impact on food quality and safety?”

Dr.ir. LPA Bea Steenbekkers
Wageningen UR (Netherlands)

Curriculum Vitae
Dr Steenbekkers is a Household and Consumer Scientist of Wageningen University by training, focusing on the dynamics of processes and practices within the household setting. She did her PhD at Delft University of Technology on a topic related to product use and safety for children, and extended this project to the elderly as a specific target group. Currently she is working at the Department Food Quality and Design of Wageningen University and is involved in education and research. Her research focuses on understanding consumer perception and behaviour related to food in the household context, to give input for consumer-driven product development.

Abstract
In the food production-consumption chain a lot of food is wasted. The consumer is generally seen as the end-point of the chain. However, this last part of the chain is a chain in itself, consisting of different phases from shopping, storing, preparation to consumption. At household level, different practices occur in each of these phases, which might result in food waste. Consumers do not buy food with the deliberate intention of wasting it; it happens, due to factors within and outside their possibilities to influence. Risk factors for food safety and food waste related to these practices will be discussed. Since ‘the consumer’ does not exist, attention will be paid to behaviours and motives in different consumer groups. This might give ideas for future solutions for the problem under discussion.
“Using cold plasma to combat noroviruses”

Dr Birte Ahlfeld
University of Veterinary Medicine Hanover

Curriculum Vitae
After her diploma from German secondary school qualifying for university admission or matriculation in 1997, Birte Ahlfeld took a gap year to do voluntary work in the environmental sector near the Danish border. In 1998, she started studying veterinary medicine at the University of Veterinary Medicine Hanover, Foundation (TiHo), and approbation in 2004.
In 2004, Birte Ahlfeld started her doctoral thesis at the Institute for Food Quality and Food Safety, finishing in 2008 with “Determination of probiotic starter cultures via flow-cytometry with special reference to lactobacilli and bifidobacteria”.
After finishing her studies in 2004, she started working in the department of milk hygiene, where she is still a member of the research staff.
Since 2010, she has been working closely with the members of the Max-Planck-Institute for Extraterrestrial Physics in Garching, Munich, on plasma medicine with non-thermal atmosphere pressure plasma (cold plasma). One focus is the prolongation of food quality and safety due to the use of cold plasma.

Abstract
Human norovirus (NoV) infections have been the most commonly identified cause for nonbacterial epidemic gastroenteritis outbreaks in Germany. In 2014, 75,040 infections were verified by laboratory diagnosis. The estimated number of unreported cases is probably higher. Epidemic outbreaks occur in hospitals (36%), retirement and nursing homes (24%), childcare facilities (12%) and private homes (10%), but also in military barracks and on cruise ships. Due to the seasonal dependence, the illness caused by norovirus infection is also termed “winter vomiting disease”, characterized by abdominal cramping, nausea, vigorous vomitus and diarrhea. The norovirus infection transmission route is fecal-oral, partly by contaminated foodstuff, but the main route is by person-to-person-contact and by contaminated environments, more particularly dependent on the very low infective dose of 10-100 virus particles.
The application of cold or nonthermal atmospheric pressure plasma is an innovative decontamination technology. Defined as a partially or completely ionized gas, plasma is the fourth state of matter. It can be generated by applying an electrical field to an
initially electrically neutral gas. Synergistic effects of the cold plasma-initiated air, which consists of nitric oxide (NO) (including its intermediates, NO radicals etc.) and reactive oxygen species (including ozone, atomic oxygen, singlet oxygen, and oxygen ions, which can have antimicrobial effects), lead to the inactivation of the virus particles. In our experiment, we treated a human Norovirus GII.4 outbreak strain with cold plasma technology, thereby showing that the treatment significantly reduced the viral load of norovirus. The detailed outcome will be presented within the Cofresco Forum 2016.
“Overview of packaging trends”

Dominique Huret
Cape Decision (Belgium)

Curriculum Vitae
Dominique got her first journalism degree at the University of Georgia (Athens - US) in 1983.

She then obtained her masters degree in political sciences and communication in 1988 at the University of Louvain-la-Neuve (UCL - Belgium).

For the next 8 years, she has been a journalist and producer with CNN (Atlanta), the BBC World Service (London), the European Commission (Brussels) and teaching in International Schools.

She has organized successful executive events and managed Europaid communication projects. She also joined the EBRD team of communication experts.

Abstract
In today’s food and beverage packaged markets, three key players are involved in the game: the consumer, the retailers and the brand manufacturers. These three see packaging innovation with their own perspectives.

As for private purchasing decisions, the consumer prevails. His choice influences retailers, who subsequently turn to manufacturers to find adequate packaging solutions to please the shoppers. As understanding the consumer is vital, the presentation will start by identifying 8 major trends which drive the consumer behaviour: high value shoppers, greener food, ageing challenges, wellness, Zen attitude, change makers, cultural diversity.

In the next decade, the food retail will also witness changes: proximity with shoppers, growth of retails brands, developing markets, technology developments and logistical efficiency. All this will take place in an agenda driven by sustainability.

The food and beverage manufacturers will have a lot to manage as plant efficiency will remain critical to long term survival. With larger range of SKU’s and strengthening of retail brands, makeovers in the value chain are needed. Food safety and sustainability are becoming imperatives while emerging markets will hold the keys to profitability.
Cofresco Forum
Cofresco Frischhalteprodukte GmbH & Co. KG founded the Cofresco Forum in 2001. The Forum’s activities are aimed at driving research in the field of household packaging for food. Over the past years, the Cofresco Forum has therefore promoted a variety of research projects. The topics ranged from active and smart packaging to alternative fresh keeping methods and sustainable packaging. In addition, the Cofresco Forum has established a large network of scientific and business experts involved with the topics of packaging, fresh-keeping and preparation of food in the household. This led to the creation of an international platform for scientists and experts which has generated a large number of ideas and scientific approaches within a comparatively short space of time in the specialist field of packaging and household packaging.

The University of Veterinary Medicine Hanover (Tierärztliche Hochschule)
The University of Veterinary Medicine Hanover (TiHo) is a university foundation in the State of Lower Saxony and the oldest independent facility for veterinary medicine in Germany.

The TiHo comprises six clinics and 19 institutes at two locations in Hanover, Germany. It also has three field offices: the Institute for Terrestrial and Aquatic Wildlife Research (ITAW) in Büsum, the Farm for Education and Research in Ruthe in the south of Hanover, and the Field Station for Epidemiology in Bakum near Vechta. Gerhard Greif is the current President. A total of 1,605 students were enrolled for veterinary medicine in the winter term 2013/14. In addition, there are 817 doctorate students and 49 masters students.

The TiHo’s main areas of research are infection medicine, clinical research, systemic neurosciences, animal health and food quality.

The Institute for Food Quality and Food Safety is part of the Virtual Centre for Animal Welfare and Food Quality at University of Veterinary Medicine Hanover.
Cofresco Frischhalteprodukte GmbH & Co KG is Europe’s leading supplier of branded products in the field of household film, foil and paper. The operating division’s brands are at home in all major European countries. Cofresco’s portfolio comprises product solutions for the wrapping, preparing and freezing of food, for the safe storage of household and garden items, and for the disposal of waste. Cofresco was founded in 1996 and is part of the Melitta Group.

At its manufacturing facilities in Minden (Germany) and Brodnica (Poland), Cofresco produces household films and foils under the brands Toppits®, Handy Bag®, Albal®, Glad® and Swirl®.

In October 2015 Cofresco acquired the British company Wrap Film Holdings Ltd. in Telford together with its Bacofoil®, Wrapmaster® and Caterwrap® brands.

Cofresco is among the leading suppliers in 15 of the 25 European countries in which Cofresco products are currently distributed.

The company has been led by Pieter van Halewijn since 1 February 2013.

### Facts & Figures

**Headquarters:** Minden

**Production:** Minden (Germany), Brodnica (Poland), Telford (United Kingdom)

**Employees:** 800

**Products:** Products made from plastic, paper and aluminium for fresh-keeping, baking/roasting, freezing

**Brands:** Toppits®, Albal®, Glad®, Handy Bag®, Swirl®, Bacofoil®, Wrapmaster®, Caterwrap®

**Core markets:** Germany, France, Scandinavia, Spain, Austria, UK

**Most important trade partner:** Food retail
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