

2nd Nordic Baltic Drying Conference 2017

# NBDC 2017

June 7-9 in Hamburg, Germany



## SECOND NORDIC BALTIC DRYING CONFERENCE

### PROGRAM

7-9 June 2017  
Hamburg, Germany

 NTNU

**TUHH**  
Hamburg University of Technology

**SPE** SOLIDS PROCESS ENGINEERING &  
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June 7 to 9, 2017 – Hamburg, Germany

## PRELIMINARY PROGRAM

Wednesday, June 7

12:00 **Registration** at the Conference venue (Hamburg University of Technology, Schwarzenbergstr. 93, 21073 Hamburg, Building H)

<b>Lecture Hall H0.16</b>	
<b>NOVELTY DAY ON SUSTAINABLE ORGANIC FOODS - DRYING AND PROCESSING</b>	
<b>Chair</b>	<i>Michael Bantle</i>
13:00	Opening of the Novelty Day at NBDC 2017 <i>O. Alves-Filho, S. Heinrich</i>
13:10	Welcome to the Workshop, General Information and Introduction to the SusOrganic Project <i>B. Sturm</i>
13:20	Market, Consumer and Technology Analyses on the Organic Sector in Five EU Countries <i>B. Sturm, G. von Gersdorff, L. Meriluoto, M. Bantle, R. Moscetti</i>
13:40	Quality and Drying Behaviour of Organic Fruit Products <i>R. Massanatinj, R. Moscetti</i>
14:00	State Diagrams in Low Temperature and Atmospheric Freeze Drying of Organic Fruit Products <i>I. Tolstorebrov, M. Bantle</i>
14:20	Smart Drying: Use of Sensors and Machine Learning for the Supervision and Control of Drying Processes <i>R. Moscetti, R. Massantini</i>
14:40	<b>Coffee break</b>
<b>Chair</b>	<i>Barbara Sturm</i>
15:00	Drying of Organic Hop and Herbs <i>B. Sturm, G. von Gersdorff, O. Hensel, S. Crichton</i>
15:20	Shelf Life Extension for Organic Meat and Fish Product by Applied Super-Chilling Methods <i>M. Bantle, I. Tolstorebrov</i>
15:40	Quality of Technological Functionality of Organic Vegetables upon Freezing <i>P. Pittia, V. Santarelli, L. Neri</i>
16:00	Challenges and Potential of Organic Meat Drying <i>G. Gersdorff, S. Retz, S. Crichton, B. Sturm</i>
16:20	Value Chain Analysis of Organic Meat and Fruits: Identifying Constraints and Opportunities <i>T. Bosona, G. Gebresenbet</i>
16:40	Life Cycle Assessment of Organic Apple Fruit Cultivated in Sweden: A Comparison of Fresh and Dried Apple Supply Systems <i>T. Bosona, G. Gebresenbet</i>
17:00	Closing Remarks

18:00 **Registration** at Hofbräu München Harburg, Lüneburger Tor 13, 21073 Hamburg

19:00 **Get together** at Hofbräu München Harburg, Lüneburger Tor 13, 21073 Hamburg

## ORAL PRESENTATION

### **Smart drying: use of sensors and machine learning for the supervision and control of drying processes**

Roberto Moschetti\* and Riccardo Massantini

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#### **Abstract**

Globalization of market entails the availability of produces regardless their production date, pursued through innovation in products and processes to obtain meat, fish and fruit vegetables with improved shelf-life, organoleptic quality, nutritional value, safety and healthiness during the whole agrofood chain. Consequently, market value of perishable commodity mainly depends on the preservation method used to guarantee food stability and thus to delay physicochemical, biochemical and microbiological spoilage. Among processing methods, drying is one of the oldest, typical, effective and viable preservation process throughout the world, which allow to prevent food spoilage and decay through moisture removal. It is a relatively complex, dynamic, unsteady and nonlinear process that, when not optimized, may be responsible for (1) quality degradation of food and (2) energy wastage. Consequently, new drying technologies must be designed to assure valuable products at the lowest carbon footprint. Among emerging drying technologies, smart drying is one of the newest and promising ones. It has potential to guarantee high-value end products, while enhancing drying efficiency, by implementing innovative and reliable sensors, resources, tools and practices. Moreover, smart drying can be cost-effective in both real-time monitoring of foodstuffs quality and dynamic controlling of operating conditions along the whole drying process. Smart drying is a multi- and inter-disciplinary sector and its recent developments embrace the following R&D areas: artificial intelligence, biomimetic, computer vision, microwave/dielectric spectroscopy, visible and near-infrared spectroscopy, hyper/multispectral imaging, magnetic resonance imaging, ultrasound imaging, electrostatic sensing and control system for the drying environment.

**Keywords:** chemometrics, artificial intelligence, deep learning

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