

# Tropentag 2013

International Research on Food Security, Natural  
Resource Management and Rural Development

## **Agricultural development within the rural-urban continuum**

### Book of abstracts

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# Preface

The annual *Tropentag*, the largest European interdisciplinary conference on research in Tropical and Subtropical Agriculture and Natural Resource Management, rotates between the universities of Bonn, Göttingen, Hohenheim, Kassel-Witzenhausen, Berlin, ETH Zurich, and the Czech University of Life Sciences in Prague.

On-going organisational support for the event is provided by the Council for Tropical and Subtropical Agricultural Research (ATSAP e.V.), the German Institute for Tropical and Subtropical Agriculture (DITSL) in Witzenhausen, and the GIZ Advisory Service on Agricultural Research for Development (BEAF). The conference stays under the patronage of the Federal Minister for Economic Cooperation and Development Dirk Niebel.

The *Tropentag* has become the most important international conference on development-oriented research in the fields of food security, natural resource management and rural development in central Europe and provides a unique platform for scientific and personal exchange for students, junior and senior scientists, development experts and funding organisations together with their international partner institutions. More than 800 participants from 75 countries underline the importance of inter- and trans-disciplinary scientific exchange to address the challenges ahead of us.

The *Tropentag* 2013 takes place on the campus of the University of Hohenheim, Stuttgart from September 17 - 19. It has been organised by the Centre for Agriculture in the Tropics and Subtropics comprising 10 tropical chairs and more than 100 members from the three faculties of the university.

The theme of 2013 is “Agricultural development within the rural-urban continuum”. According to projections of the UN, 70 % of the global population will be living in urban areas by 2050. This will induce some radical changes in the share and distribution of food, energy, water, nutrients, labour, and other resources between rural and urban systems. Sustainable agricultural production and short resource cycles are required to sustain livelihoods in both rural and urban communities. Enlarging the primary production base in urban areas, increasing energy production in rural areas, and strengthening the interfaces along the continuum are among the major challenges for agricultural development. This year’s conference will particularly focus on how agri-

cultural systems can be interfaced efficiently along the rural-urban continuum with regard to resource availability, food production, social peace, health, ecological sustainability and related themes.

The contributions and discussions focus particularly on the following aspects of the rural-urban continuum:

- Agricultural production systems
- Resource use and energy
- People and livelihoods
- Development and markets

These will be addressed by several internationally renowned keynote speakers, via 20 oral sessions presenting more than 100 talks and by about 350 poster presentations in 30 guided poster sessions. A special session featuring the international centres IWMI and AVRDC will underline the role of the CGIAR in linking rural to urban food systems.

We hope that the scientific contributions in this conference book will help you find answers to the research and development questions related to these topics and to the theme “Agricultural development within the rural-urban continuum”.

Our special thanks go to the colleagues from Berlin, Bonn, Gießen, Göttingen, Hamburg, Halle, Kassel-Witzenhausen, Prague, Rottenburg, Vienna and Hohenheim who acted as reviewers for the submitted abstracts and thus contributed substantially to maintaining the scientific standard of the conference. We like to express our gratitude to Eric Tielkes, DITSL Witzenhausen, without whose support the conference would not have been possible, and our thanks include the University of Hohenheim for providing financial and logistical support and all our donors whose financial contributions have made this conference possible and affordable especially for young scientists.

We welcome you to the University of Hohenheim and wish you an enjoyable and rewarding conference.

The organising committee of Tropentag 2013

Prof. Dr. Folkard Asch (Hohenheim)

Prof. Dr. Regina Birner (Hohenheim)

Dr. Barbara Ramsperger (Hohenheim)

Dr. Christian Hülsebusch (DITSL Witzenhausen)

Dr. Eric Tielkes (DITSL Witzenhausen)

Hohenheim, September 2013

## Message

The theme for this year's *Tropentag*, "Agricultural development within the rural-urban continuum" has a very special significance. The question of how agricultural production will respond to the dramatic shift in the rural-urban continuum is not only highly relevant but also vital for the future. In developing countries, rural areas still have the highest birth rates. Therefore, even with a high rural exodus, the absolute population in these areas will experience an increase lasting far into the next decade. The size of the rural population will not start to fall until later in this century. On the other hand, cities are growing at an unprecedented rate. From the estimated global population of 9.6 billion in 2050, 70 % will be urban inhabitants.

Already today the demand for food from a growing urban population in the developing countries is huge. A large middle-class is forming in the cities of these countries too, with a growing appetite for better quality, high protein foods. Must this increased overall demand be primarily met by buying on world markets? Or could local agriculture provide sufficient goods to cover the growing demand? Increased urbanization offers huge opportunities for development, not only for cities but also for rural areas and for agriculture. Urbanisation gives many small farmers the opportunity to make the leap from subsistence farming to producing for urban markets. This opportunity to earn an income can, for many families in rural areas, be the decisive step away from poverty and hunger. At the same time, new forms of "urban agriculture" are also offering interesting opportunities for development in the growing cities.

In order to ensure that they are the main actors in the value chain, beginning with seed and ending with high quality goods on an urban market stall, smallholders have many needs that must be met: secure access to land, water and energy, to capital and production factors, and to knowledge and innovation. Higher yields and improved production are not enough. Agriculture also has to protect and make sustainable use of natural resources. This will not only secure future agricultural production, but will also help to preserve all the ecosystem services that the countryside provides for the city. Town and country live from and for each other. They can form a permanent "development partnership", with agriculture as the crucial link, for the mutual benefit of both sides.

The development opportunities that the sustainable intensification of agriculture offers for rural areas had long been neglected. Low prices for agricultural commodities

on the world markets encouraged imports of cheap food in many places and provided little incentive for countries to develop their own agricultural sectors. Over the past few years this situation has changed. Not only have the world prices for agricultural goods increased, in many countries we are now pleased to note increased political will to promote sustainable agriculture. German development policy is consistently and energetically supporting this new drive to develop agriculture. This is also because, compared with investments in other sectors, investments in the agricultural sector have by far the greatest impact on reducing poverty. When I took office in 2009, I made rural development, promoting agriculture and food security one of the political priorities of the Federal Ministry for Economic Cooperation and Development (BMZ). I also significantly expanded our financial commitments in this sector. In the past four years approximately 3 billion euros has been provided for measures in this context.

I wish the *Tropentag* every success. It can offer trend-setting contributions for sustainable agricultural production that fosters development and contributes to environmental protection.

Dirk Niebel  
Federal Minister for Economic Cooperation and Development

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## **Yield and Keeping Quality of Freshly Prepared Breakfast Sausage as Affected by Time *post mortem***

OLUSEGUN OSHIBANJO, ANDREW BABATUNDE OMOJOLA, ELIZABETH JOEL  
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Sausage meat was harvested at six hours *post mortem* intervals. The same sausage recipe was used for all times: Beef (65 %), lard (20 %), soybean binder (3.5 %), green spices (2.19 %), dry spices (1.5 %), ice water (4.5 %), salt (2 %), sugar (1 %), sodium nitrite (0.01 %), and phosphate (0.3 %). Sausage prepared was subjected to proximate analysis, physiochemical evaluation, sensory evaluation, microbial evaluation and Thiobarbituric acid (TBA). The sausage was stored for 14 days at 4°C.

There were significant ( $p < 0.05$ ) differences observed in product yield, pH value, cooking loss and water holding capacity among the treatments. Product yield decreased as time *post mortem* increased. 99 % product yield was observed for 0 hour time *post mortem* compared to 86.87 % at 24 hours. The pH increase with time *post mortem*, the same was observed for cooking loss and water holding capacity. The proximate composition showed significant ( $p < 0.05$ ) differences for freshly prepared sausage as affected by time *post mortem*. Variation was observed in the moisture, protein, fat and ash content.

Thiobarbituric acid (TBA) values significantly differed ( $p < 0.05$ ), with greater values obtained from 0 and 6 hours time *post mortem*, decreasing as time *post mortem* increased. There were significant ( $p < 0.05$ ) differences in total plate counts for microbial analysis, which increased as time *post mortem* increased.

Sensory evaluation score of sausage made 6 hours *post mortem* was highest for colour, juiciness, overall acceptability and tenderness, and significantly different ( $p < 0.05$ ) from those of other treatments.

0 and 6 hour time *post mortem* were recommended from this experiment to harvest meat for best yield and for keeping the quality of sausage.

**Keywords:** Breakfast sausage, keeping quality and meat, time *post mortem*, yield