AnSciCon WS 2021/22 PROGRAMME

Annual Scientific Conference of Applied Bio and Food Sciences WS 2021/22
on 14 December 2021
(Link to the online meeting room will be provided after registration)

Registration under

https://hs-flensburg.de/form/anscicon

Hochschule Flensburg
University of Applied Sciences

ausgezeichnet als:
Innovative Hochschule
Eine gemeinsame Initiative von Bund und Ländern

Kanzleistraße 91–93
24943 Flensburg

T +49(0)461–01
www.hs-flensburg.de

Dear visitors , teaching staff, professors and dear students,

I have the honor to welcome you to the Annual Scientific Conference of Applied Bio and Food Sciences WS 2021/22. This conference has been organized by our students of the master programme „Applied Bio and Food Sciences“ at Flensburg University of Applied Sciences in cooperation with the University of Jember, Indonesia. At this year's conference, the main focus is on sustainable and innovative research and development.

Global challenges such as climate change, water scarcity and the lack of raw materials call for sustainable and innovative solutions. The bioeconomy aims to generate, develop and use biological resources in order to meet human needs for raw materials, products and services. The projects this year deal, among other aspects, with the topic of innovative food, such as in-vitro meat or sorghum (millet).

This conference provides an optimal opportunity for our students to present the knowledge and the skills that they have gained in the current semester while acquiring experiences crucial for organizing scientific conferences as well.

I want to thank everyone involved in the conference for their work and wish you all an enlightening and inspiring day.
Sincerely,

Dr. Christoph Jansen
President of Flensburg University of Applied Sciences

Dear conference participants,

It is a great pleasure to welcome you to the conference **AnSciCon WS 2021/22 at Flensburg University of Applied Sciences** facilitated by the students of the master study programme "Applied Bio and Food Sciences".

The Master programme "Applied Bio and Food Sciences" has a duration of three semesters. During the first semester, students acquire a theoretical foundation, whereas in the second semester the students design and conduct a research project on a specific advanced topic in Bio and Food Technology. Additionally, they gain skills for scientific work. This conference and its proceedings are an integral part of the programme. The third and final semester is dedicated to the Master Thesis, which is usually written in industry or research institutes.

Today's conference is the final highlight of the second semester. The conference is organized by students for students. The content of the conference but also all organisational parts have been scheduled and prepared by the students independently. All arrangements have been conducted in an international context, as this conference is facilitated jointly with students from **our partner university Jember in Indonesia** . We are very proud of this international character. It reflects the modern environment, in which science and education is happening today.

During the conference, the students will present the results obtained through this semester's projects reflecting the overarching semester topic "sustainability". The projects show the connection of education, research and technology transfer our university stands for. The various talks will offer insights into current and relevant topics such as cultured meat technology, stress resistance in sorghum and vectors of the dengue virus.

Furthermore, there is the possibility to discuss these interesting topics with the students directly in breakout sessions.

The success of the projects is based on the efforts put by the students into their projects. We, as the professors, congratulate the project teams on this success and wish the best for the conference today.

We thank you for joining in and wish you an exciting day, with interesting presentations and inspiring discussions.

Prof. Dr. Birte Nicolai, Dr. Holger Rehmann, Prof. Dr. Antje Labes, Prof. Dr. Andreas Nicolai, Prof. Dr. Hans-Udo Peters

Lecturers of the Master's study Applied Bio and Food Science, Flensburg University of Applied Sciences

Introduction

Global challenges such as climate change, water shortage and the lack of raw materials have increasingly been calling for sustainable and innovative solutions, especially in the last decade.

The bioeconomy aims to produce, develop and use biological resources to meet the human needs for raw materials, products and services. Through the international cooperation of Flensburg University of Applied Sciences (Germany) and the University of Jember (Indonesia), projects have been funded again this year to address these problems and provide possible solutions.

For example, the SORGHUM project focuses on the tropical plant *Sorghum bicolor*, which is known to have higher drought tolerance. The BACTERIA project, in turn, has been researching a possible solution to prevent the transmission of diseases by the mosquito Aedes Aegypti. Furthermore, the projects BEEF and ALADIN deal with the topic of "in-vitro meat", which could become a possible future alternative to conventional meat production.

Time Table December 14, 2021

German time (Indonesian time)	Agenda	Referents
09:00-09:15 (15:00-15:15)	Time to enter the conference	
09:15-09:30 (15:15-15:30)	Opening words	Diana Ledowski
09:30-09:40 (15:30-15:40)	Welcoming words from the president of Flensburg University of Applied Sciences	Dr. Christoph Jansen
09:40-09:50 (15:40-15:50)	Welcoming words from the president of the University of Jember	Dr. Iwan Taruna
09:50-10:00 (15:50-16:00)	Coffee break	
10:00-10:05 (16:00-16:05)	Introduction to the indonesian projects	Prof. Dr. Kartika Senjarini
10:05-10:50 (16:05-16:50)	SORGHUM	Wulan Arum Hardiyani, Arsetyo Rahardhianto
10:55-11:40 (16:55-17:40)	BACTERIA	Beny Andika, Aufar Finasrullah, Diah Ayu Utami
11:45-12:30 (17:45-18:30)	Lunchbreak	
12:30-12:35 (18:30-18:35)	Introduction to the german projects	Dr. Holger Rehmann
12:35-13:20 (18:35-19:20)	BEEF	Mahmood Al-Sagheer, Gerhard-Patrick Hauschildt, Diana Ledowski
13:25-14:10 (19:25-20:10)	ALADIN	Waleed Al-Orry, Thies Jagdmann, Annika Roering, Sabine Ternowez
14:15-14:30 (20:15-20:30)	Closing words	Gerhard-Patrick Hauschildt
14:30- (20:30-)	Poster session	

SORGHUM – *Regulation of gene expression for carbon and nitrogen assimilation in sorghum (Sorghum bicolor) during drought stress*

Sorghum bicolor, a tropical C4 plant, is known to have marked drought tolerance. Sorghum has a higher capacity to maintain photosynthesis than other cereal crops under drought stress. However, drought effects are marked by changes in the physiological and biochemical process, which has been studied regarding the inhibition of protein synthesis. A large number of changes in gene expression leads either to up- or down- regulation that occurs in plants growing under drought stress conditions. The C4 plant photosynthesis is designated by the presence of phosphoenolpyruvate carboxylase (PEPC) and ribulose-1,5-biphosphate carboxylase/oxygenase (Rubisco) enzymes for carbon assimilation. Other enzymes are strongly modulated in drought stress such as nitrate reductase (NR) and sucrose phosphate synthase (SPS). NR is the enzyme for nitrogen assimilation which catalyses nitrate reduction. Sucrose is a disaccharide and a major end product of photosynthesis, which is a form of regulated plant productivity. SPS is the key enzyme for sucrose synthesis. This study examined the regulation expression of carbon and nitrogen assimilation enzyme genes in sorghum during drought stress by analysing physiological and molecular characteristics. Plants were exposed to drought stress several days: 0 (control), 3, 6 and 9 days. The gene expression was detected by real-time PCR. Based on the previous study, gene expression in drought-treated sugarcane decreased when compared to the controls. Drought stress increased PEPC and SPS activity and decreased NR activity in sorghum leaves.

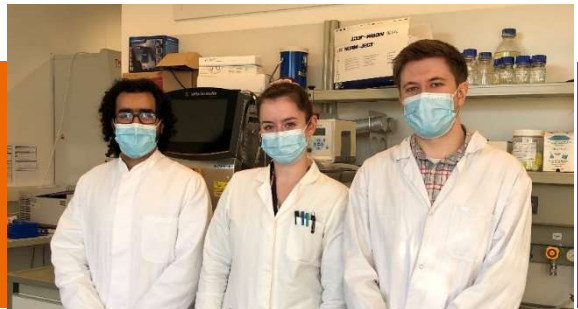
BACTERIA – *Screening of bacterial symbiont from the midgut of main dengue mosquito's vector, Aedes aegypti*

The female *Aedes aegypti* mosquito is the primary vector of the dengue virus that causes Dengue Haemorrhagic Fever (DHF). The success of the transmission process is influenced by the ability of the dengue virus to infect several mosquito organs, the midgut organ being one of them. The midgut organ serves as the site for the incubation phase for viral replication. The incubation phase of the dengue virus can be delayed or even fail due to the bacteria associated with the midgut organ. Therefore, it is necessary to observe bacterial species associated with the midgut organ of *Ae. aegypti*. This research aims to determine the bacteria associated with the midgut organ of *Ae. aegypti*. The objects of this research are the morphological characteristics and 16S rDNA sequences of bacteria. The research main stages consist of in silico analysis, sampling and morphological identification of mosquito, and midgut isolation and identification of midgut-associated bacteria.

BEEF – *Be Efficient: How can the culture medium for in-vitro beef be manipulated towards improvement?*

For decades, it has been difficult to offer a suitable alternative for meat that not only has the same characteristics, but also similar nutritional values. Cell culture technology is involved in research on in-vitro meat, and this research has become increasingly important in the recent years. The realization of an in-vitro meat production system could help to protect the environment by reducing emissions, water consumption and land use. Another important issue is ethics, because in-vitro beef production does not require the slaughter of animals. Therefore, it is important to continue research in this area.

Since beef is more energy-intensive than meat from other livestock in its production, we have chosen cattle as our research object. The focus of this project is on the isolation and cultivation of bovine tissue cells with regards to optimizing culture conditions. For this purpose, satellite cells are isolated from fresh meat and cultivated in different media set-ups. Various methods are used to test which medium has the greatest influence on the successful cell growth of the bovine cells. By improving the culture conditions of in-vitro beef, a further step towards an environmentally friendly and ethical solution for a beef production system can be created.



ALADIN – *Analytical determination of differentiation in mammalian cell cultures by qPCR*

For many people meat as a food is an indispensable component of a wholesome meal that should be financially available to all social classes. However, there are many critical aspects such as environmental aspects in particular high emissions of greenhouse gases, high water consumption and a large demand for farmland for the meat industry. Further aspects are a growing world population and ethical aspects such as the mostly poor keeping conditions, which make a rethink in the production and consumption of meat inevitable.
One possibility for this is the research field of in-vitro meat, which has received more and more attention in recent years. After a research project on the cultivation conditions of satellite cells was carried out at Flensburg University of Applied Sciences last year, we want to take up the results and integrate them into a further research project. The aim of our research project is to monitor the differentiation process of porcine satellite cells and to determine the exact differentiation status by means of qPCR. With self-designed primers we want to detect specific differentiation markers for this purpose. To be able to do this, this project also deals with cell cultivation conditions and the induction of differentiation of satellite cells through the targeted exchange of culture medium to differentiation medium. In addition, we vary the media composition of our differentiation media and take samples during the process in order to gain a better understanding of the differentiation process of porcine satellite cells as well as a good control method for the differentiation process. In this way, we hope to be able to make a small scientific contribution to having an efficient and animal-friendly alternative to conventional meat production in the not too distant future.