



# Cocoa and Chocolate Competences & Related Projects at the Zurich University of Applied Sciences (ZHAW)

The ZHAW has been researching on cocoa and chocolate for decades. Our competences, located in various research groups in four different institutes, cover the entire supply chain from the harvest and post-harvest processing of cocoa beans to the development of novel manufacturing processes for chocolate. In the field of cultivation, we collaborate with research institutes from the agricultural sector.

## 1. Our competences along the cocoa value chain:



### Cultivation

#### Agronomic factors (with partners):

- Pest incidence
- Shade level
- Humidity
- Temperature
- Cultivation system
- Varieties
- Etc



### Post-Harvest Processing Harvest → Fermentation → Drying



#### Post-harvest monitoring and optimization:

- Evaluation & monitoring of relevant process parameters over time as well as modulation & optimization of fermentation and drying aiming at enhanced and reproducible quality



#### Flavour research & chemical characterization:

- Decoding of flavour attributes on molecular level
- Monitoring of chemical constituents along the cocoa value chain



#### Sensory analysis and consumer sciences:

- Sensory evaluation & monitoring of cocoa and chocolate flavour attributes within the cocoa and chocolate value network & measurement of consumer preferences for the resulting chocolate products



#### Development of innovative processes and products:

- Optimization of cocoa bean processing, development of innovative products with focus on high cocoa content and research on the preservation and extraction of bioactive compounds in cocoa



### Chocolate Processing Roasting → Conching → Molding



#### Analysis of regulative and normative requirements:

- Research, publications, teaching and organization of conferences in Swiss and European food law as well as incorporation of requirements at international level, e.g. ISO, into scientific activities



#### Social analysis:

- Social impact analysis of cocoa cultivation & analysis of site suitability and of changes due to climate change (CONSUS)



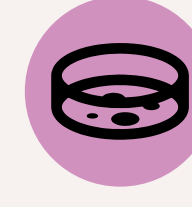
#### Life cycle assessment:

- Quantification of resource consumption, climate impact, environmental footprint, and other environmental indicators along the full value chain, from cradle to grave



#### Data management and visualization:

- Mapping and analysing connected data as well as visualization of complex data and intuitive user interfaces



#### Centre for biochemical engineering and cell cultivation technique

Read More:  
[zhaw.ch/cocoa-excellence](http://zhaw.ch/cocoa-excellence)

## 2. From research to practice: Projects

### Cocoa in Numbers

Generating a cocoa database as a tool for more transparency along the cocoa value chain.



Field: → → →  
Involved groups: 🧪 🧬 🧠 📊 🌱 🌍

### Optimization of cocoa post harvesting

From traditional techniques to functional microbial cultures for cocoa fermentation.



Field: → →  
Involved groups: 🧪 🧬 🧠

### Aroma Kit Cocoa

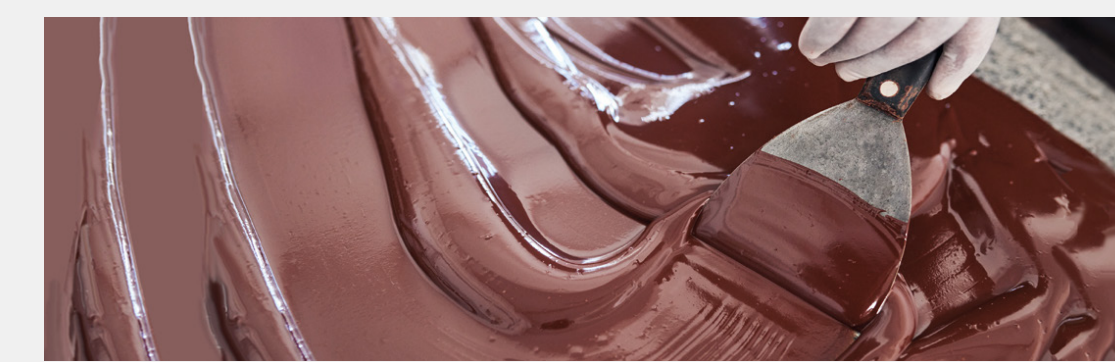
An olfactory library for cocoa and chocolate.



Field: → → →  
Involved groups: 🧪 🧠 🧬

### Development of a new process

A novel technology approach for cocoa bean processing.



Field: → →  
Involved groups: 🧪 🧠 🧬

### Chocolate from cocoa cell cultures

Production of a sustainable plant cell based chocolate.



Field: → → →  
Involved groups: 🧪 🧠 🧬

## 3. Research groups/centers & contacts @ZHAW: An interdisciplinary research approach

### ILGI – Institute of Food and Beverage Innovation:

- 🧪 **Food Biotechnology Research Group:** Prof. Dr. Susanne Miescher Schwenninger (susanne.miescher@zhaw.ch), Susette Freimueller Leischfeld (susette.freimueller@zhaw.ch)
- 🧬 **Food Chemistry Research Group:** Prof. Dr. Irene Chetschik (irene.chetschik@zhaw.ch)
- 🧠 **Food Perception Research Group:** Annette Bongartz (annette.bongartz@zhaw.ch), Karin Chatelain (karin.chatelain@zhaw.ch)
- 💡 **Research Group for Food Process Design:** Thomas Flüeler (thomas.flueeler@zhaw.ch)
- 🔬 **Quality Management and Food Law:** Dr. Evelyn Kirchsteiger-Meier (evelyn.kirchsteiger-meier@zhaw.ch)

### IUNR – Institute of Natural Resources Sciences:

- 🌱 **Geography of Food Research Group:** Isabel Jaisli (isabel.jaisli@zhaw.ch), Sonja Trachsel (sonja.trachsel@zhaw.ch)
- 🌍 **Life Cycle Assessment:** Matthias Stucki (matthias.stucki@zhaw.ch)

### ICLS – Institute of Computational Life Science:

- 📊 **Data Management & Visualization:** Dr. Robert Vorbürger (robert.vorbuerger@zhaw.ch)

### ICBT – Institute of Chemistry and Biotechnology:

- 🧪 **Biochemical Engineering and Cell Cultivation Techniques** Prof. Dr. Dieter Eibl (dieter.eibl@zhaw.ch)