

## DISCOVERY

## Unraveling the cocoa code: Barry Callebaut discovers undetected polyphenols as it develops 'cocoa atlas'

By Vladimir Pekic, 23-Nov-2015

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**Barry Callebaut has found previously undiscovered cocoa polyphenols as it works with Bremen-based Jacobs University to crack the commodity's molecular code.**

An interdisciplinary team of scientists from the university and Barry Callebaut are working under the COMETA (COcoa METAbolomics) project to develop what they call a 'cocoa atlas' by 2020.

The researchers have utilized technology from the petrochemical and life sciences industries. By fine-tuning mass spectrometers, they can now analyze a large number of cocoa molecules - fats, polyphenols and others - at the same time.

### Hidden polyphenols

Out of the 20,000 molecules that the research team has so far identified in cocoa, an estimated three-fourths are polyphenols previously unknown to science. Although Barry Callebaut has previously studied polyphenols in depth, this finding still came as a surprise.

Polyphenols were known to be the most important candidates for beneficial health effects, as well as playing a major role in color and flavor formation during processing. The sheer volume of the polyphenol find means the playing field now has "increased astronomically".

Gino Vrancken, project lead at Barry Callebaut, told ConfectioneryNews: "Nobody has an answer why cacao is this complex and it remains the biggest mystery about this plant... What it means for the industry as a whole is that most of the potential of the bean has gone unrecognized and unexplored and therefore also un-valorized."

### The complex mystery of cocoa

The cocoa bean's complexity dwarfs that of many other plants, he said. Moreover, when the bean is fermented, roasted, ground to become cocoa powder or conched to become chocolate, the complexity only increases.

"The project aims to impact every process that is touched by cacao, it will change how beans are graded, priced and bought. It will change how processing is performed. It will allow development of new processes that retain more of cocoa beneficial properties," said Vrancken.

Furthermore, COMETA will allow for the optimization of raw material and energy use and it will speed up the way that new products are developed in the cocoa industry, he said

### Parts of research in public domain

COMETA began in 2014 and is scheduled to run until 2020.

The aim of COMETA is to create a new functional classification system for cacao, and tools to predict flavor and color development.

Although the COMETA project is 100% financed by Barry Callebaut, many benefits will be shared openly. "The largest portions of the fundamental work will be released into the public domain. By this, we hope to encourage the entire industry to re-appreciate what a wonderful raw material we all have the privilege to be working with," said Vrancken.

"We envision a whole new area (perhaps even era) of intra- and inter-industry developments to hash out all the value that will be covered by the findings," Vrancken concluded.

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