



News Release

Barry Callebaut presents findings on cocoa research Cocoa bean fermentation key to chocolate taste

- **Research isolates bacteria responsible for flavor creation during cocoa bean fermentation**
- **Better understanding of the fermentation process will enable Barry Callebaut to enhance chocolate flavor**

Wieze/Belgium, 21 May 2007 – Cocoa beans develop their flavor during the fermentation process. They undergo several biochemical changes, which determine their aroma and, ultimately, the taste of the resultant chocolate. Barry Callebaut, the world's leading manufacturer of high-quality cocoa, chocolate and confectionery products, teamed up with the University of Brussels (Vrije Universiteit Brussel) to analyze the formation of these aroma precursors during the cocoa bean fermentation. The researchers found that good fermentation is the result of the specific characteristics of lactic acid bacteria and acetic acid bacteria. The ability of these microorganisms to break down citric acid and sugars and to oxidize ethanol, respectively, resist acidic environments, and tolerate alcohol and heat defines the taste of the resultant chocolate. This new insight into the very first stage of the chocolate-making process will enable Barry Callebaut to further enhance the flavor of chocolate.

Herwig Bernaert, Innovation Manager Healthier Chocolate, explains: *“This research is of great importance, because the spontaneous fermentation of cocoa, which takes place in the bush, lies at the basis of the entire chocolate-making process. It is the critical first step in determining the final flavor and taste components of chocolate at the end of the manufacturing process. Studying the microbiological and biochemical reactions that occur during the fermentation process of the cocoa bean helps to increase our knowledge. With these new findings we can further influence our entire chocolate-making process.”*

The research, conducted by the Research Group of Industrial Microbiology and Food Biotechnology of the Vrije Universiteit Brussel (VUB) on behalf of Barry Callebaut, involved the meticulous analysis of cocoa bean fermentation at the cocoa plantations. The fermentation process takes five to seven days. After the cocoa farmers remove the pulp from the pods, the beans are covered with banana leaves and left to ferment. The process removes the pulp from the beans, which then change color from beige to purple as they develop their aroma. Researchers made frequent visits to Ghana, living amongst local farmers to study this natural process. During their research they unraveled key metabolic pathways in *Lactobacillus plantarum*, *Lactobacillus fermentum*, and *Acetobacter pasteurianus*, and discovered new kinds of bacteria, such as the lactic acid bacterium, *Weissella ghanensis*, and the acetic acid bacterium, *Acetobacter ghanensis*, which all help develop the flavor associated with chocolate.

“The secrets of the spontaneous cocoa bean fermentation process are gradually being unravelled thanks to the application of a combination of microbiological and chromatographic techniques on the one hand and modern molecular and mass spectrometric techniques on the other,” says Prof. Luc De Vuyst of the Industrial Microbiology and Food Biotechnology research group at the Vrije Universiteit Brussel.



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The complete findings of the research will appear over the coming months in the renowned scientific journals, “Applied and Environmental Microbiology”, “International Journal of Food Microbiology”, and the “International Journal of Systematic and Evolutionary Microbiology”.

***Prof. Dr. ir. Luc De Vuyst** is professor of industrial microbiology and head of the Research Group of Industrial Microbiology and Food Biotechnology at the Vrije Universiteit Brussel, Brussels, Belgium. The group’s research focuses on food fermentations (functional starter cultures) and gut health (probiotics and prebiotics).*

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Barry Callebaut :

With annual sales of more than CHF 4 billion for fiscal year 2005/06, Zurich-based Barry Callebaut is the world’s leading manufacturer of high-quality cocoa, chocolate and confectionery products – from the cocoa bean to the finished product on the store shelf. Barry Callebaut is present in 24 countries, operates more than 30 production facilities and employs approximately 7,500 people. The company serves the entire food industry, from food manufacturers to professional users of chocolate (such as chocolatiers, pastry chefs or bakers), to global retailers. It also provides a comprehensive range of services in the fields of product development, processing, training and marketing.

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