

# ACTICOA™: Health and protection from the cocoa bean

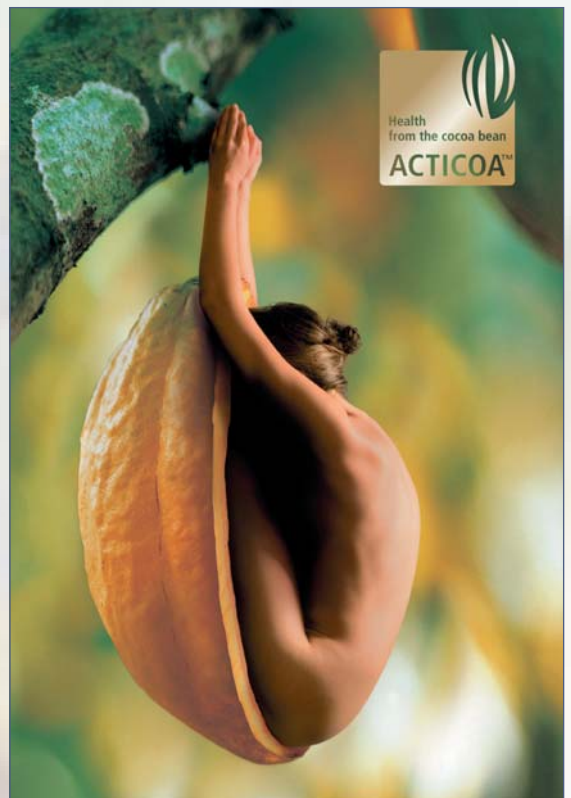
**BARRY CALLEBAUT**

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**INTRODUCTION**

The remarkable medicinal and nutritional properties of the cocoa bean have been known and exploited for centuries by traditional cultures around the globe. Recently, scientific studies have begun to unravel the mysteries surrounding this ancient medicinal source. Much of the attention over recent years has been devoted to the role of the so-called polyphenols (cocoa flavanols) found in abundance in the cocoa bean. These are powerful antioxidants thought to play a major role in several areas of human health – from cardiovascular health and immune response to brain function, while helping to protect the body against the damaging effects of free radicals.

Barry Callebaut, inspired by the potential benefits of this remarkable plant, has devoted a great deal of energy, resources and know-how not only into unlocking the secrets of the cocoa bean but also into developing ways to incorporate these benefits into chocolate. Despite the claims of several chocolate manufacturers, the flavanols found in the cocoa bean are in fact partially destroyed during the conventional chocolate-making process. The challenge for Barry Callebaut was therefore to develop a production process which could preserve and enhance these components without compromising the celebrated taste and texture of real chocolate. ACTICOA™, Barry Callebaut's answer to this challenge, is the first chocolate to guarantee a minimum polyphenol content and is now the richest source of antioxidants known to man.



**THE EXTRAORDINARY COCOA BEAN**

In South America, Africa and South-East Asia, cocoa has played an integral role within several ethnobotanical traditions. As a diuretic, an antiseptic and even as toothpaste, its applications are equally diverse. More commonly, it has been a central ingredient in general medicinal applications for the treatment of anything from kidney ailments to rheumatism, listlessness, chest pains as well as being applied to burns, snake bites and other wounds.

Cocoa is also a vital source of important vitamins, minerals and other nutrients such as magnesium, which

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stimulates memory function, and theobromine and caffeine, which have positive effects on the respiratory and central nervous systems. Indeed, of the approximate 600 compounds that have been isolated from the cocoa bean, more than 200 are thought to have positive effects on health and well-being.

The majority of cocoa's beneficial properties are, however, attributed to the activity of one special class of compounds known as the polyphenols, more specific cocoa flavanols, which are strong antioxidants believed to have numerous positive effects on several aspects of human bodily function. While the cocoa bean is one of the richest known sources of antioxidants, the particular sub-type of polyphenols found in abundance in the cocoa bean – the procyanidin flavanols – are also regarded as the most powerful.

### COCOA FLAVANOLS AND THE CHOCOLATE-MAKING PROCESS

Many chocolate manufacturers are exploiting the mounting evidence in support of the nutritional effects of cocoa, making particular reference to the power of cocoa flavanols. However, in doing so many manufacturers neglect the fact that part of them, though abundant in the raw cocoa bean, are in fact destroyed during the various stages of the conventional chocolate-making process. Moreover, there are a multiplicity of factors which determine the flavanol content of the end product even before the chocolate-making process begins. Flavanol content can vary enormously depending on the variety and origin of the cocoa plant and even within a single origin, soil and climate conditions can result in significant inconsistencies in flavanol content.

However, it is the chocolate-making process itself which is predominantly responsible for the loss of flavanols. Between the fermentation and drying of raw cocoa and subsequent processing through alkalisation, roasting, liquor extraction and couching, up to 85% of the original flavanol content is lost, in many cases leaving less than 0.5% of the total amount in the final product (1).

Aware of the growing body of evidence in support of the potential benefits of cocoa

flavanols and faced with the significant loss of these compounds during the conventional chocolate-making process, chocolate manufacturer Barry Callebaut devoted years of intensive research towards developing alternative techniques for preserving and enhancing the presence of cocoa flavanols in chocolate. As a result of that painstaking research, ACTICOA™ succeeds in preserving up to 70% of the natural flavanol content of raw cocoa without the use of extracts, additives or other chemical substances.

### ACTICOA™: BACK TO THE BEAN

Each stage of the chocolate-making process – from bean selection to conching – was analysed and adapted in order to guarantee maximum flavanol content. ACTICOA™ cocoa beans are selected according to strict criteria based on variety, origin and cultivation conditions. In the various subsequent process steps extra care is being taken to preserve the natural content of flavanols (Figure 1).

The results of the ACTICOA™ process are striking. ACTICOA™ chocolate is the only chocolate which can guarantee a minimum of flavanol content in chocolate – 2 times more than in standard chocolate.

### STRONG RISE IN THE CONSUMPTION OF FUNCTIONAL CHOCOLATE

As the global leader in innovation, Barry Callebaut's approach has always been to combine progressive technologies with thorough market research. Barry Callebaut's research and development efforts are therefore very much a

response to a growing trend towards natural, healthy and functional foods and away from artificial additives.

HANS VRIENS, Chief Innovation Officer at Barry Callebaut, explains: "The results of a recent consumer survey (2) demonstrate that more than 1 in 3 Europeans would buy chocolate which promised health benefits. Moreover, almost 1 in 2 Europeans would be prepared to pay more for health friendly or enhancing chocolate."

Chocolate with natural added health benefits has clearly gained in popularity over the last year. Whereas a consumer survey in December 2006 still showed relatively low consumption rates, the results of the 2008 consumer survey were very encouraging. In the US 35% of consumers have tried functional chocolate (in comparison to 13% in 2006), in Switzerland 23% (1%), in the UK 20% (1%), in Belgium 17% (3%), in Germany 12% (1%) and in France 7% (2%). On an international scale the functional chocolate segment grew by 15% in value on average per year over the last 4 years (3) reaching \$ 577 million in total sales in 2006, according to Euromonitor International.

### INNOVATION: THE FUEL OF PROGRESS

Barry Callebaut's research into cocoa polyphenols is part of a wider emphasis on innovation at the world's leading chocolate manufacturer. 'Going back to the bean' has, indeed, led to innovative techniques and products in other areas besides chocolate, such as revolutionary fat-free frying oils, cosmetics and even beer brewing agents.

Barry Callebaut's ACTICOA™ chocolate and cocoa powder is just one example of 'going back to the bean'. ACTICOA™ is the outcome of years of research aimed at preserving and enhancing the function of cocoa flavanols, one of the most powerful antioxidants known to man.

Other innovations aimed at improving the permissibility of chocolate include a sugar-reduced, fibre-enriched chocolate which succeeds in improving the nutritional profile of chocolate without the use of artificial additives. Intensive research at Barry Callebaut has also resulted in a probiotic chocolate as well as the

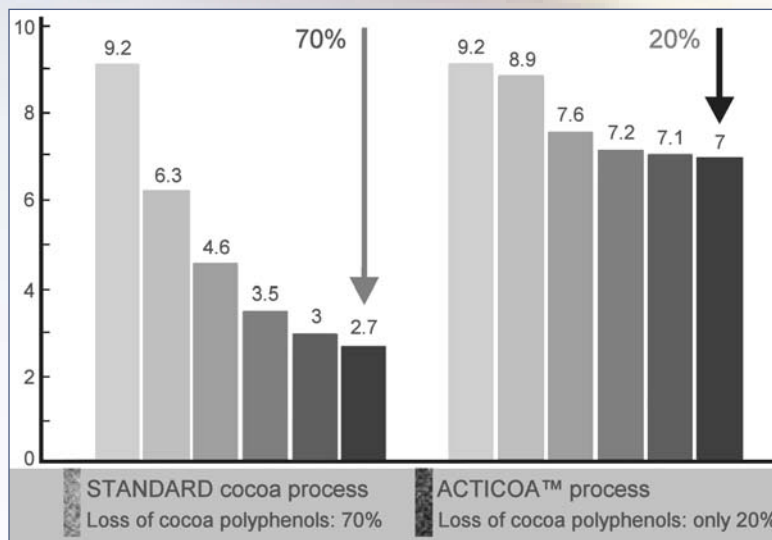


Figure 1 – Polyphenol (cocoa flavanols) content over the various stages of the chocolate-making process. Conventional chocolate vs. ACTICOA™ chocolate

world's first sugar-based tooth-friendly chocolate. Best of all, Barry Callebaut's healthy chocolate range has the same great taste, texture and mouthfeel as conventional chocolate. In fact, Barry Callebaut is always looking for ways to enhance that celebrated chocolate experience even further.

## HEALTH AND WELLNESS, EXPERIENCE AND INDULGENCE AND CONVENIENCE

Barry Callebaut's innovation strategy is founded on three main pillars: health and wellness, experience, and indulgence and convenience. Barry Callebaut's ACTICOA™ chocolate and cocoa powder is just one example of its innovations.

Recent innovations include functional food innovations such as probiotic chocolate, tooth-friendly

chocolate and White Chocolate and Fruit.

Barry Callebaut is also able to offer its customers a variety of rebalanced chocolate applications that address the growing demand for healthier, more nutritionally-conscious food products. The spectrum of these nutritionally improved profiles includes: fiber-enriched and sugar-reduced, sugar free and fat-reduced chocolate.

Since January 2008, Barry Callebaut has launched more than 80 projects with customers to co-develop chocolate applications with an improved nutritional profile without lessening indulgence.

As the innovative chocolate expert, Barry Callebaut was first to respond to customer demands for a new generation of chocolate that meets the need for better health choices.

It is both an opportunity and a responsibility to help chocolate manufacturers develop nutritionally

rebalanced, innovative chocolate applications without sacrificing the quality of indulgence.

### For more information:

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## REFERENCES AND NOTES

- 1) Based on a typical chocolate recipe: 46% sugar, 42% cocoa liquor, 11.4% cocoa butter, lecithin, flavours
- 2) Data gathered by independent research bureau Ipsos in a consumer survey carried out between 07-28 Jan 2008 in Belgium, Switzerland, France, Germany, UK, US on behalf of Barry Callebaut
- 3) 2002-2006 Euromonitor International

# NutraCos news

## NEW STANDARD FOR POPULAR STEVIA-BASED SWEETENER TO ASSURE MANUFACTURERS AND CONSUMERS OF PRODUCT'S QUALITY

FOOD AND BEVERAGE MANUFACTURERS INVITED TO COMMENT ON PROPOSED REBAUDIOSIDE A STANDARD THROUGH USP'S FOOD CHEMICALS CODEX FORUM

Responding to the growing popularity of a plant-based sweetener, the **U.S. Pharmacopeial (USP) Convention** announced it is developing a new standard to be included in the *Food Chemicals Codex (FCC)* that will help food and beverage manufacturers assure the product's quality for consumers. USP is seeking comments from the food and beverage industry as well as all other interested parties on the proposed new standard for this new sweetener, *Rebaudioside A*. *Rebaudioside A* is a stevia (*Stevia rebaudiana* Bertoni)-based sweetener used in foods and beverages around the world as an alternative to sugar and other non-caloric sugar substitutes, such as sucralose and aspartame. *Rebaudioside A* is isolated from the leaves of the Latin American stevia plant and gives the plant leaves their sweet taste. Use of *Rebaudioside A* in food and beverage products in the United States is poised to increase sharply as manufacturers begin to develop and launch a series of new

products using this new ingredient. The proposed *FCC* standard for *Rebaudioside A* is available for review to all interested parties via the *FCC Forum* – the mechanism through which USP accepts public comment on standards to be included in the *FCC* – before the final standard is published in the compendium.

"As U.S. manufacturers begin to incorporate this new ingredient into their products, it is important for these companies and, ultimately, consumers to have some sort of assurance that the *Rebaudioside A* being used is of high quality, is free of harmful contaminants and is consistent in its contents from one batch to the next," said DARRELL ABERNETHY, M.D., Ph.D., chief science officer for USP. "By proposing a standard that all manufacturers – in the United States and around the world – can participate in the development of and subsequently choose to adhere to, USP and food and beverage manufacturers can partner to assure the quality of this ingredient. Consumers also are able to participate in this process. We believe such a quality standard is critical given that *Rebaudioside A*'s use as a sweetener is relatively new in the United States." The proposed monograph standard became available in the *FCC Forum* section of USP's web site ([www.usp.org/fcc/forum](http://www.usp.org/fcc/forum)) on December 31, 2008, for 90 days. After this comment period, USP's Food Ingredients Expert Committee, which comprises a group of independent, scientific experts, will approve the final

monograph to be included in the 2009 *FCC* supplement.

The *FCC* monograph for *Rebaudioside A* will contain specifications related to the ingredient's identity, purity and potential impurities, and will include supporting analytical test procedures and use of USP chemical reference standards. The chemical reference standards will be established through USP's open, independent and collaborative testing process to ensure their suitability for the intended uses in the monograph test procedures. Once developed, the *FCC Rebaudioside A* monograph and associated reference standards will provide an objectively established standard against which both producers and purchasers can compare their ingredients to assure their quality.

### USP and FCC

USP is an independent, non-profit, scientific organization that has been setting chemical standards for close to 200 years. These standards are used in more than 130 countries throughout the world. In 2006, USP acquired the *FCC*, a compendium of internationally recognized standards that helps to assure the quality and purity of food ingredients used by manufacturers who produce food products, from the Institute of Medicine. USP released the sixth edition of the *FCC* – the first edition published under its direction – in February 2008. A new edition of the *FCC* will be released every two years, with supplements published between each edition.

For more information, visit [www.usp.org](http://www.usp.org)