

Special article

## Chocolate and medicine: Dangerous liaisons?

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**Abstract**

According to ancient Mayan texts, cocoa is of divine origin and is considered a gift from the gods. In the Classic period of Mayan civilization (250–900 A.D.), ground cocoa seeds were mixed with seasonings to make a bitter, spicy drink that was believed to be a health-promoting elixir. The Aztecs believed that cocoa pods symbolized life and fertility, and that eating the fruit of the cocoa tree allowed them to acquire wisdom and power. Cocoa was said to have nourishing, fortifying, and aphrodisiac qualities. Pre-Columbian societies were known to use chocolate as medicine, too. The appreciation and popularity of chocolate fluctuated over the centuries since its introduction to Europe from the New World. Now, recent evidence has begun to erase the poor reputation that chocolate had acquired in the past few decades and is restoring its former status. Chocolate is no longer deemed a guilty pleasure, and it may have positive health benefits when eaten in moderation as part of a balanced diet. © 2009 Elsevier Inc. All rights reserved.

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### Chocolate: Indulgence or medicine?

In Europe the relation between chocolate and medicine dates back to Columbus' voyages of discovery to the New Continent.

At that time many new and unusual foodstuffs started appearing on European dining tables, but some were slow to gain acceptance. Because these products were indigenous to a "barbarous" country, Christian Europeans looked on them with suspicion. Chocolate in particular was considered sinful and dangerous, as was every black, hot, and spicy substance, which evoked the depths of hell to their conservative sensibilities.

Chocolate soon acquired an intriguing reputation; the conquistador Hernand Cortés had written to the Spanish Crown saying that it was a miracle beverage: "A cup of it gives every soldier the strength to march for an entire day" [1].

Moreover, it was rumored that Montezuma used it to satisfy his numerous wives: "From time to time the men of Montezuma's guard brought him, in cups of pure gold, a drink made from the cocoa-plant, which they said he took before

visiting his wives ... I saw them bring in fifty large jugs of chocolate, all frothed up, of which he would drink a little" (Bernal Díaz del Castillo, 1560) [2].

Among other treasures, the explorers brought back to Spain the valuable secret of *xocolatl*. It was initially of very thick consistency because it was prepared from cocoa, maize flour, and spices. Then, over time, the recipe was improved with the addition of sugar from the East Indies and vanilla from Mexico.

Chocolate's euphoriant effects were immediately apparent, to the extent that the Church declared that anyone fasting who drank chocolate was considered to have broken his religious fast.

The situation reached the point that if Europeans wanted to eat or drink chocolate, it could only be for medicinal reasons! Doctors hastened to assert that tea, coffee, and, above all, chocolate were healthy substances and used this argument to promote their pleasurable effects. The result was a boost to the lucrative trade in these exotic imports.

The consumption of chocolate became known mainly in Southern Europe, but its popularity was not widespread, and was limited to the elite. However, chocolate still needed approval and acceptance from the medical establishment of the day. This proved problematic, because opinions varied, resulting in confrontations among physicians.

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### Medicinal bebida

The first writers who promoted the use of cocoa and chocolate for therapeutic purposes reported what they saw among the people of the New World. M. De La Cruz was a teacher at the Santa Cruz College, which was founded in Mexico City by the Spanish in 1536. He confirms that chocolate was used to treat angina, constipation, dental problems, dysentery, asthenia, gout, and many other diseases [3].

The Spanish friar Bernardino de Sahagún was the author of a very interesting manuscript, the *Florentine Codex* [4], which is preserved in Florence. Unlike many priests who visited the New World, and who viewed the inhabitants of Mexico as savages with “ungodly” customs, Sahagún was curious about Mexican medical culture and he recorded a vast amount of knowledge. The information within the *Florentine Codex* is critical to understanding the early medical-related history of chocolate. The document warned against excessive drinking of cocoa prepared from unroasted beans, but recommended it if used in moderation. It stated that drinking large quantities of green cocoa made imbibers confused and deranged, but if taken in moderation, the beverage was invigorating and refreshing.

Friar Agustín Davilla Padilla recommended the use of chocolate for kidney disease [5]. In 1577, Francisco Hernandez affirmed that it was used to treat liver disease. Also, four cocoa beans with holly gum fought dysentery; the medicine called *atextli* was made from a thin paste of cocoa beans and maize, mixed with *mecaxochitl* (*Piper sanctum*) and *tlilxochitl* (*Vanilla planifolia*), and was used as an aphrodisiac [6].

Thin people could benefit from the use of a beverage made with seeds of *pochotl* and *cacahoatl*, which was claimed to be very invigorating and strengthening.

However, the medical use of cocoa needed to be tested within the framework of European medical understanding of the time: according to the allopathic system of therapy, it was believed that “opposites cure opposites.” Diseases, herbs, and other drugs were given “qualities” and degrees of heat, moisture, etc., based on a sensory subjective assessment [7]. A medieval health handbook, the *Tacuinum Sanitatis*, lists various plants and animals and their corresponding “qualities” [8]. A physician would determine the nature of a disease and then choose the proper remedy: “cold” diseases had to be treated with “hot” remedies and vice versa; similarly, “dry” ailments needed “damp” remedies.

Thus, doctors had to understand the true nature of chocolate and of the substances that were added to it in the preparation of the beverage.

Francisco Hernandez (1577) wrote that pure cacao paste prepared as a beverage treated fever and liver disease. He also mentioned that toasted, ground cacao beans mixed with resin were effective against dysentery, and that chocolate beverages were commonly prescribed to thin patients for them to gain “flesh” [6].

In 1618, Bartolomeo Marradón, the doctor in the Spanish town of Marchesa [9], was quoted by Antonio Colmenero de Ledesma in his treatise on the nature and quality of chocolate [10]. He published an imaginary dialogue on chocolate between a doctor, an “Indian” man, and a townsman, and in this conversation, the doctor says that cocoa is not only a pleasant beverage, but it is an authentic remedy that can be used in different forms, as *panecitos*, *tablillas*, or *en caxa como conserva*.

Santiago de Valverde Turices (1624) made a distinction between the cold quality of cocoa and the hot and dry quality of chocolate, which had to be used for cold and damp diseases. According to him, chocolate had to be considered an authentic remedy because it could alter a patient’s constitution. Drunk in large amounts, it was useful for chest diseases; if consumed in small quantities, it could have beneficial effects on the stomach [11].

Thomas Gage (1648) described a medicinal chocolate prepared with black pepper used to treat “cold liver.” Gage wrote that chocolate mixed with cinnamon increased urine flow and was an effective way to treat kidney disorders [12].

In 1662, Cardinal Francis Maria Brancaccio pronounced that *liquidum non frangit jejunum*, or that drinking liquid [chocolate] does not constitute a break in fasting [1].

The discussion surrounding the medical use of chocolate eventually spread outside the boundaries of Spain and reached Great Britain, which had joined the countries involved in the conquest of the New World. Henry Stubbe (1662) reported that chocolate was very useful “if one is tired through business, and wants speedy refreshment.” He wrote that people should drink chocolate beverages once or twice each day to relieve tiredness caused by strenuous work. He also related that ingesting cacao oil was an effective treatment for the “Fire of St. Anthony,” i.e., ergot poisoning.

Stubbe also described chocolate-based concoctions mixed with Jamaican pepper that were used to treat menstrual disorders, and other chocolate preparations blended with vanilla to strengthen the heart and to promote digestion [13].

Stubbe was the personal doctor of King Charles II and a close friend of Thomas Hobbes. He dedicated his treatise to Thomas Willis, who was one of the most outstanding physicians of the time. In it he reported that English soldiers in Jamaica lived on cocoa paste, mixed with sugar, and dissolved in water. He noted that it could be used as an expectorant, a diuretic, or an aphrodisiac, and it was suitable for treating “hypochondriacal melancholy” when caused by an obstruction of the veins by “black bile,” and above all when it was associated with stomach weakness and weight loss.

William Hughes (1672) reported that coughs could be treated by drinking chocolate blended with cinnamon or nutmeg. He wrote that chocolate nourished the body, induced sleep, and cured the “pustules, tumours, and swellings commonly experienced by hardy sea-men who had long been kept from a diet of fresh foods, symptoms akin to scurvy” [14].

Nonetheless, opinions were not unanimous, and beliefs could change over the course of time. The authoritative voice of Madame de Sevigné had emerged from Paris to support the use of chocolate. However, she later forbade her pregnant daughter to drink it, because a friend of hers, the Marquise de Coetlegon, had drunk too much chocolate while pregnant and subsequently delivered a black child. The baby did not live long. Madame de Sevigné unfortunately neglected a minor detail: that her friend had a black servant [15].

The reputation of chocolate as an aphrodisiac flourished in the French royal court, where erotic art and literature were inspired by the seductive substance. Also, it was claimed that the famous libertine, Giacomo Casanova, was partial to drinking chocolate before his romantic trysts [1].

### *Chocolats de santé*

From the 16th to the early 19th centuries, numerous travel accounts and medical texts documented the purported merits and medicinal value of chocolate. The composition and preparation of chocolate changed often during this period.

In Florence the debate surrounding chocolate was very heated, and even ensnared the grand ducal family. Cosimo III de Medici had concocted a secret recipe for a chocolate paste used for making hot chocolate. He had the recipe developed by his court scientists to rival the Spanish chocolate paste, which was flavored with vanilla, musk, and amber. Cosimo III's concoction proved to be a great success and was sent to European courts as a gift.

When Cosimo III's son and successor died, the Medici chocolate recipe became public: it was flavored with jasmine, vanilla, cinnamon, and ambergris. The jasmine flavor came from the jasmine flower itself and was not an extract. This was typical of the extravagant Tuscan court from the 1660s to the late 1700s. Francesco Redi, a scientist, poet, physician, and apothecary to Cosimo III de Medici, created this renowned jasmine chocolate drink. It was a bittersweet, rich, floral, and opulent drink, flavored with *Jasminum sambac* (syn. *Nyctanthes sambac*), a particular species of jasmine native to southern Asia, India, the Philippines, and Sri Lanka [16].

From the 17th to the 18th centuries, the strong aroma of baroque chocolate gave way to the simple, pure taste of the chocolate of the Enlightenment age. The assertion that, "Gods drink ambrosia, men drink chocolate," was written in a treatise on the use and abuse of chocolate, printed in Venice in 1779.

In 1769, Antonio Lavedan claimed that chocolate was beneficial but only if drunk in the morning, and he strongly cautioned against the afternoon use of this beverage. He wrote that chocolate alone—with no other food—could keep those who drank it robust and healthy for many years, and added that drinking chocolate prolonged life [17].

Chocolate's reputation caused Carl von Linnè to baptise the cocoa tree as *Theobroma cacao*, food of the gods, to make its name seem nobler [18]. His interest then focused on the spices that were added to chocolate. He also summarized the different

qualities of chocolate, as food and as therapeutic substance. He identified three kinds of disease against which chocolate could be used with positive results: weight loss due to pulmonary and muscle problems, hypochondria, and hemorrhoids. He also underlined its aphrodisiac efficacy. In addition, cocoa butter was commonly used as a suppository.

It was during the age of Enlightenment that medicine and dietetics diverged as distinct disciplines, and that the investigation of therapy and taste followed separate paths. Chocolate was relegated to the role of excipient, and acquired a negative reputation over time, generating a *topos* in medical and non-medical literatures, which associated it with obesity, dental problems, and an unhealthy lifestyle.

### Coming back to the future

Recent research has suggested that chocolate has a positive effect on many health problems, and has thus regained its primary reputation as a medicine [19,20].

Nowadays, the question being debated is whether to consider chocolate as food or medicine. It is certainly a functional foodstuff, known to produce interesting physiologic effects, and is able to promote good health. We could combine the two words, *food* and *medicine*, and treat chocolate as a *medi-food*. This would serve to assert its nutritious functions and its therapeutic powers.

### References

- [1] Dillinger TL, Barriga P, Escarcega S, Jimenez M, Salazar Lowe D, Grivetti LE. Food of the gods: cure for humanity? A cultural history of the medicinal and ritual use of chocolate. *J Nutr* 2000; 130(Suppl):2057–72.
- [2] Diaz del Castillo B. The conquest of New Spain. New York: Penguin; 1983.
- [3] De la Cruz M. The Badianus Manuscript, Codex Barberini, Latin 241, Vatican Library; an Aztec herbal of 1552. Baltimore: Johns Hopkins University Press; 1940.
- [4] Sahagun B. General history of the things of New Spain [Florentine Codex, 1590]. Santa Fe: School of American Research, University of Utah Monographs of the School of American Research, and Museum of New Mexico; 1981.
- [5] Torres EM. La relación fraile-indígena en México. In: A través de las plantas tres ejemplos el tabaco, el cacao y las nopaleras. Rome: Istituto Storico Domenicano; 1997, p. 227–92.
- [6] Hernández F. Historia de las plantas de la nueva España. Mexico City: Imprenta Universitaria; 1577.
- [7] Temkin O. Galenism: rise and decline of a medical philosophy. Ithaca: Cornell University Press; 1973.
- [8] Bovey A. Tacuinum sanitatis: an early renaissance guide to health. Seattle: University of Washington Press; 2006.
- [9] Marradon B. Curioso tratado de la naturaleza, los daños y provechos que el tempo y experiencia an descubierto de sus efectos, y del chocolate, y otras bevila, que en estos tempo se usan. Interlocutores un medico con un indiano, y un ciudadano. Seville: Gabriel Ramos; 1618.
- [10] Colmenero de Ledesma A. Curioso tratado de la naturaleza y calidad del chocolate. Madrid: Francisco Martinez; 1631.
- [11] de Valverde Turices S. Un discurso del chocolate. Seville: J. Cabrera; 1624.
- [12] Gage T. The English American: his travail by sea; or a new survey of the West Indies containing a journall [sic] of three thousand three

- hundred miles within the main land of America. London: Cotes; 1648.
- [13] Stubbe H. The Indian nectar, or, a discourse concerning chocolate [*sic*]: the nature of the cacao-nut and the other ingredients of that composition is examined and stated according to the judgment and experience of Indian and Spanish writers. London: J.C. for Andrew Crook; 1662.
- [14] Hughes W. The American physitian [*sic*], or a treatise of the roots, plants, trees, shrubs, fruit, herbs etc. growing in the English plantations in America: describing the place, time, names, kinds [*sic*], temperature, vertues [*sic*] and uses of them, either for diet, physick [*sic*], etc. whereunto is added a discourse of the cacao-nut-tree, and the use of its fruit; with all the ways of making of chocolate. The like never extant before 1672. London: J.C. for William Crook the Green Dragon without Temple Bar; 1672.
- [15] Rabutin Chantal M. Lettres choisies. Paris: Garnier Freres; 1878 (lettres 11.2.1671; 15.4.1671; 13.5.1671; 23.10, 1671).
- [16] Cooking Tribby J. (with) Clio and Cleo: eloquence and experiment in seventeenth-century Florence. *J Hist Ideas* 1991;(LII):417–39.
- [17] Lavedan A. Tratado de los usos, abusos, propiendades y virtudes del tabaco, café, te y chocolate. Madrid: Imprenta Real; 1796.
- [18] von Linné (Linneaus) C. Om chokladdyken. Stockholm: Fabel; 1741.
- [19] Franco OH, Bonneus L, de Laet C, Peeters A, Steyerberg EW, Mackenbach JP. The polymeal: a more natural, safer, and probably tastier (than the polypill) strategy to reduce cardiovascular disease by more than 75%. *BMJ* 2004;329:1447–50.
- [20] Usmani OS, Belvisi MG, Patel HJ, Crispino N, Birrell MA, Korbonits M, et al. Theobromine inhibits sensory nerve activation and cough. *FASEB J* 2005;19:231–3.