



LifeMap™ Alert Chews

Chocolate is the number one craved food in North America - and with good reason. Researchers have found that certain compounds in chocolate cause the brain to release endorphins, chemicals that make us feel good. Other compounds improve cognitive function, increase energy, and help normalize appetite. In fact, studies show men and women have more brain and heart stimulation from eating chocolate than from kissing!¹ Chocolate's scientifically-proven effects were the inspiration for LifeMap™ Alert Chews. One or two servings of LifeMap™ Alert Chews can improve concentration and focus, elevate mood and provide long-lasting energy.

LifeMap™ Alert Chews are low calorie chocolate-based confection containing a patented (US patent 7,048,941) dietary supplement called Chocamine®. Chocamine® is a cocoa extract containing an exclusive blend of the compounds associated with health benefits of chocolate, but without the calories, fat or dairy found in chocolate candy. Chocamine® contains several important phytochemicals including natural mood, cognitive and performance-enhancing substances. In addition, Chocamine® is rich in the same type of antioxidants that give red wine its heart-protecting reputation.² The beneficial effects of chocolate come from more than one component and Chocamine® is the only dietary supplement that combines the sensory benefits of chocolate with several of the bioactive compounds in a unique and synergistic blend. The bioactive compounds found in Chocamine® include:

Theobromine

Chocamine® is standardized to the phytochemical theobromine, a methylxanthine similar to caffeine, but primarily found in chocolate. Theobromine has similar stimulatory properties as caffeine, but without the addictive properties. Theobromine's action as a central nervous system stimulant is a result of its antagonism of adenosine receptors. As a neuromodulator, adenosine has mood depressing, sleep-inducing and vasodilating properties. It also slows down heartbeat, decreases the rate of spontaneous nerve cell firing and inhibits the releases of other neurotransmitters that control excitability or responsiveness of the central nervous system. Theobromine selectively blocks adenosine receptors and competitively inhibits the action of adenosine and indirectly affects the release of norepinephrine, dopamine, acetylcholine, serotonin, glutamate, and gamma-aminobutyrate (GABA).^{3,4} These neurotransmitters are associated with increased energy, improved mood, enhanced focus and appetite suppression. The psychostimulatory properties of theobromine are largely a result of the adenosine antagonism. Theobromine also has bronchodilator properties.⁵ These functions make theobromine particularly interesting for long-distance and endurance sports, as well as mountain sports.

Phenylethylamine (PEA)

Chocamine® also contains phenylethylamine, an endogenous biogenic amine that is naturally-occurring in chocolate. A review of the literature indicates that phenylethylamine (PEA) may be a neuromodulator of aminergic synapses and that it promotes energy and elevates mood.⁶ Chocolate contains large amounts of PEA (0.4-6.6 micrograms/gram), and it has been suggested that chocolate craving is an attempt to make up for low levels of PEA in the brain.⁷

Clinical Studies

Chocamine® was the subject of a preliminary study evaluating its effect on cognitive function as measured by the following parameters:

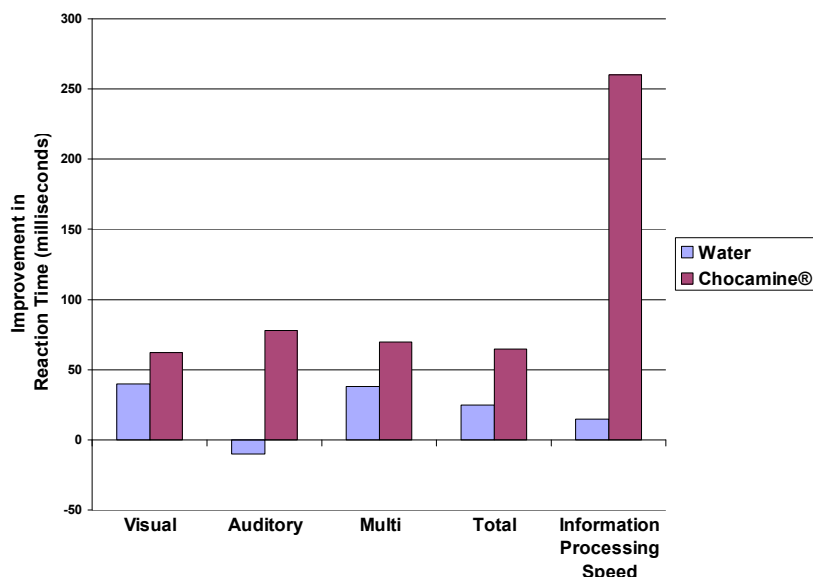
- Mental acuity
- Focus/execution
- Integration between visual and auditory input
- Reaction time
- Decision-making



To document the effect of Chocamine® on brain cortical integration of visual stimuli in volunteers, the Audio-Visual Multi-processing Test (AVMT) was used. The AVMT consists of a series of either visual, auditory, or alternating visual/auditory commands. The volunteer must respond by pressing the correct area on the touch screen based on short-term memory of the previous command. The reaction times are recorded and average reaction times are calculated for the visual phase, the auditory phase, the alternating visual/auditory phase and the overall reaction time for the total test. This clinically-approved test is a standard test in neuropsychology and is currently used in 150 clinical settings including the National Academy of Neuropsychology.

The data from the AVMT studies show that consuming Chocamine® resulted in enhanced cognitive function as observed by:

- Increased reaction times;
- Improved ability to react fast to alternating auditory and visual commands;
- Improved ability to ignore interfering auditory commands while remaining focused on visual tasks.



This information is for educational purposes only.

These statements have not been evaluated by the FDA. These products are not intended to diagnose, treat, cure, or prevent any disease.

¹ BBC News. <http://news.bbc.co.uk/1/hi/health/6558775.stm>, April 16, 2007.

² Serafini M., et al. Plasma antioxidants from chocolate. *Nature*. (2003) 424, 1013.

³ Daly, J.W., et al., The role of adenosine receptors in the central action of caffeine. In: *Caffeine and Behavior: Current Views and Research Trends*. (1999) Edited by Gupta, BS and Gupta U. Boca Raton, FL: CRC Press. 1-16.

⁴ Daly J.W., et al., Subclasses of adenosine receptors in the central nervous system: Interaction with caffeine and related methylxanthines. (1983) *Cellular and Molecular Neurobiology*. 3(1) 69-80

⁵ Simons F.E., et al. The bronchodilator effect and pharmacokinetics of theobromine in young patients with asthma. *J Allergy Clin Immunol*. (1985) 76(5):703-7.

⁶ Sabelli, H.C. & Javaid J.I., Phenylethylamine Modulation of Affect: Therapeutic and Diagnostic Implications. (1995) *Journal of Neuropsychiatry*. 7(1): 6-14.

⁷ Bruinsma, K. & Taren, D.L., Chocolate: food or drug? *Journal of the American Dietetic Association*. (1999) 99(10):1249-1256.

Nutritional Information

Ingredient	Per 1 Chew	Calculation Method
Energy (total calories)	20	Calculation
Total Carbohydrates (g)	4	USDA Handbook No.8
Sugar (g)	3	
Total Protein (g)	< 1	AOAC 981.10
Theobromine (mg)	60	HPLC
Caffeine (mg)	2.5	HPLC