From: Smith, Rebecca

Sent: 9/30/2014 9:00:55 AM

To: TTAB EFiling

CC:

Subject: U.S. TRADEMARK APPLICATION NO. 85544660 - COCOA SUNCARE - 1011-TM-1272 - Request for Reconsideration Denied - Return to TTAB - Message 9 of 10

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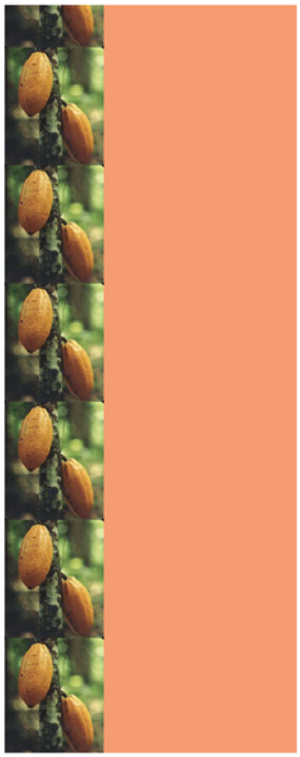
Attachment Information:

Count: 8

Files: e-18.jpg, e-19.jpg, f-1.jpg, f-2.jpg, f-3.jpg, f-4.jpg, f-5.jpg, f-6.jpg



14. New weight loss product combines dark chocolate and hoodia gordonii
Phytobase Nutritionals, Inc. recently introduced its latest weight-loss product: dark chocolate. ChocoLeans uses organic or non-organic dark chocolate, mixed with hoodia gordonii and Chinese wolfberry to help dieters suppress their appetites while enjoying dark chocolate, which is craved by virtually...
www.newstarget.com/006132.html

15. Hero Nutritionals Launches Line Of Chocolate Calcium Bites (press release)
Hero Nutritionals, a leading manufacturer of nutritional supplements, has launched Healthy Indulgence, a line of calcium chocolate bites made with real chocolate. Each chocolate bite contains 500 mg of calcium, 25 calories, two carbohydrates, no trans fats and up to 70 percent cacao. Healthy Indulgence...
www.newstarget.com/006015.html

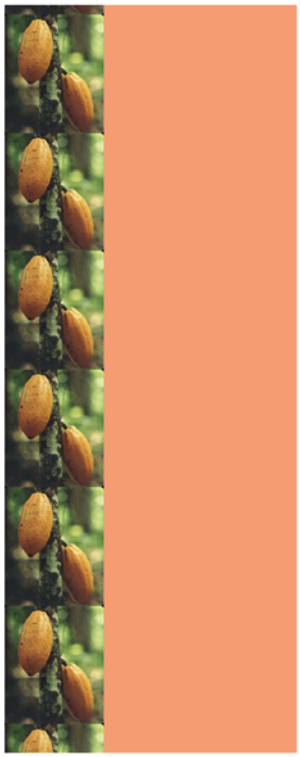
16. Chocolate may hold natural cancer-fighting properties
Scientists have discovered a chemical in chocolate that has been found to keep cancer cells from dividing, raising hopes that it may someday be used to fight the deadly disease. When the chemical, pentamer, was applied to breast cancer cells, the cells stopped dividing. Even better, four of the cells'...
www.newstarget.com/007220.html

17. Insurance firm urges clients to prevent heart disease by eating more chocolate
It's good advice, too: chocolate is actually a rainforest herb called theobromine cacao. It is, technically, potent medicine, and it treats far more than just heart disease. The anti-oxidants in chocolate also help fight cancer. But don't go crazy on the chocolate bars: the added sugars in nearly all...
www.newstarget.com/002898html

18. Chocolate is actually a powerful herb used for thousands of years as a healing agent
As this news shows, cocoa contains a powerful mixture of health-enhancing anti-oxidants. Most people don't know it, but cocoa is a rainforest herb. Technically known as Theobroma Cacao, the cocoa bean has been used for thousands of years by indigenous tribes in South and Central America. Cacao is used...
www.newstarget.com/000475.html

19. Cocoa is loaded with anti-cancer phytochemicals and compounds, says research
It's true: cocoa can prevent and reverse cancer. That's because it's loaded with powerful phytochemicals found naturally in the cacao plant -- the source of cocoa and just one of many Amazon herbs. But in the real world, people will take this information and misuse it: they'll stuff down chocolate bars...
www.newstarget.com/000132.html

20. Theobromine, a compound in chocolate, works as effective cough medicine
Chocolate (cocoa) is a rainforest herb, after all. It also has anti-cancer properties. Researchers in the UK gave 10 healthy volunteers tablets which contained either theobromine, found in cocoa, codeine, the cough suppressant, or a placebo. The volunteers were told to inhale a gas containing capsacin...
www.newstarget.com/002530html



21. **Don't listen to Mom about chocolate**
The old wives' tale about chocolate causing acne has been told to children for decades, but new products comprised of chocolate made for the skin seek to prove otherwise. To learn more on this topic, be sure to also read the related article, Cocoa is loaded with anti-cancer phytochemicals and compounds...
www.newstarget.com/010566.html

22. **Fruits, vegetables and dark chocolate can help prevent breast cancer**
An overwhelming amount of research has shown that a diet rich in fruit and vegetables can help reduce the chances of developing breast cancer, according to National Dietetic Association representative Jeannie Maloo. "We should all be eating about nine servings of fruits and vegetables a day," she said...
www.newstarget.com/007668.html

23. **Chocolate fights disease**
Scientists have recently found that not only does chocolate taste good, it can also fight diseases like diabetes, strokes and dementia. Related articles on this topic are also available on the NewsTarget Network, including: Cocoa is loaded with anti-cancer phytochemicals and compounds, says research...
www.newstarget.com/010510.html

24. **List of aphrodisiacs has a few surprises: mustard and asparagus among the foods that spur romance**
You've likely heard (or maybe even experienced) that chocolate, strawberries and even oysters have that special ability to bring on "the mood." Now, the Rocky Mountain News has recently published a new list of aphrodisiacs, and it has a few surprises. Mustard and asparagus join carrots, bananas, almonds...
www.newstarget.com/004609.html

25. **Marketers finding success selling health benefits of junk food; experts skeptical of tactics**
Supermarkets are filled these days with traditional junk food products like sugar coated cereals and even candy, that claim to, in many ways, be good for you. Experts warn consumers not to take these marketing gimmicks too seriously. "Candy is candy," one nutritionist says, scoffing at the idea of a...
www.newstarget.com/003590.html

26. **Food myths can be tough to crack**
Some foods that are generally considered healthy, such as smoothies and energy bars, can actually be bad for your health in some forms - for example, if they are packed with sugar - while items commonly thought of as junk foods, like pizza and chocolate, can have some nutritional benefits if prepared...
www.newstarget.com/009732.html

27. **Dietician: Some indulgences are actually heart healthy in moderation**
According to the Hollister Free Lance, dietician Jennifer Zapata says indulgences like dark chocolate, red wine and even coffee can actually help keep your heart healthy if consumed sparingly. Be sure to read the related article, Cocoa is loaded with anti-cancer phytochemicals and compounds, says research...
www.newstarget.com/000937.html

GMJ - Ghana Medical Journal

Ghana Med J. Dec 2009; 43(4): 164–168. PMCID: PMC2956371

Effects of the Intake of Natural Cocoa Powder on Some Biochemical and Haematological Indices in the Rat

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Summary

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Background

Natural cocoa and cocoa products are increasingly attracting the attention of many investigators and the general public because of their potential nutritional and medicinal properties and other claims.

Objective

This study sought to evaluate the effect the consumption of natural cocoa powder has on some biochemical and hematological indices in the rat, as a way of establishing the biochemical basis for some of the claims made for the consumption of cocoa and its products.

Methods

Male Wistar albino rats were fed natural cocoa powder in an aqueous suspension for 48 days, Biochemical and haematological indices were then determined from blood samples.

Results

The treatment had no significant effect on ALT, AST, ALP, uric acid, total protein,

The treatment had no significant effect on ALT, AST, ALP, uric acid, total protein, haemoglobin and haematocrit levels. However, there were significant reductions in the total cholesterol level (2.52 ± 0.07 mmol/L) versus (1.88 ± 0.23 mmol/L), LDL - cholesterol level (1.09 ± 0.03 m mol/L) versus (0.74 ± 0.06 m mol/L), and in triglyceride level (1.28 ± 0.15 m mol/L) versus (1.08 ± 0.04 m mol/L) after treatment ($p < 0.05$). The results further indicated significant increases in white blood cell (7.53 ± 0.19 × 10^3/mm^3) versus (10.40 ± 1.66 × 10^3/mm^3) and platelet counts (379± 112.0× 10^3/mm^3) versus (583.8±11.4× 10^3/mm^3).

Conclusion

The administration of natural cocoa powder to rats caused significant reductions in total serum cholesterol levels, LDL-cholesterol levels and triglycerides with a significant increase in white blood cell counts.

Keywords: Cocoa powder, alanine aminotransferase, aspartate aminotransferase, alkaline phosphatase, lipid profile

Introduction

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Claims for the medicinal capabilities of cocoa include, treatment of heart pain, shortness of breath, anaemia, burns, snakebite and wounds, angina, lowering of blood pressure, improving the efficiency of insulin action and anti-inflammatory properties amongst others.[1] These medicinal properties have long been associated with the polyphenolic compounds which give flavor and color to chocolate.[2] Cocoa polyphenols (flavanols) have been reported to have a wide range of biological properties including modulating eicosanoid synthesis, increasing nitric oxide synthesis, lowering the rate of LDL-cholesterol oxidation, inhibiting platelets activation, stimulating the production of anti-inflammatory cytokines among others.[3,4]

By helping to protect tissues against stress, certain polyphenols work as preventive medicines for problems such as cardiovascular diseases, cancer, arthritis and autoimmune disorders.[5] They act as antioxidants due to their free radical scavenging properties, their ability to reduce the formation of free radicals and their ability to stabilize membrane by decreasing membrane fluidity.[6,7] Among botanical medicines, cocoa, ginkgo, elderberry and green tea are examples of rich sources of antioxidant polyphenols.[8] Some polyphenols (such as proanthocyanidins) exert beneficial cardiovascular effects through inhibition of platelet aggregation.[9]

Excess amounts of these polyphenols could theoretically extend blood clotting times.[10] Examples of polyphenolic compounds present in cocoa are the flavan-3-

ols or flavanols, which include the monomeric forms, (-) - epicatechin and (-) - catechin, and the oligomeric forms of the monomeric units, the procyanidins.[11,12]

There have been calls for the use natural cocoa and its products for various benefits. According to Addai,[13] the regular intake of cocoa and chocolate is a must for healthy living. While the intake of cocoa is not good for people with very low blood pressure, it could reduce the rate of diabetes and hypertension, and could reduce the risk of getting stroke and aneurysm.[13] The objective of this investigation was to evaluate the effect the consumption of natural cocoa powder has on some biochemical and haematological indices in the rat, as a way of establishing the biochemical basis for some of the claims made for the consumption of cocoa and its products.

Biochemical parameters investigated included lipid profile, which helps to determine risk of coronary heart disease; serum proteins to ascertain how the liver and kidney are functioning, development of infection and fluid collection among others. Uric acid is needed to monitor how quickly cells are broken down in the body or inefficiencies in uric acid metabolism. Aspartate aminotransferase (AST), alanine aminotransferase (ALT) and alkaline phosphate (ALP) are used to evaluate hepatocellular function, detect and monitor cardiac disease as well as bone integrity.

Haematological indices (full blood count), gives or provides valuable information about the blood and the bone marrow. This information is useful in diagnosing anaemia, infection and other diseases associated with blood cell function.[14]

Method

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Animals and treatment

Male Wistar albino rats (4–5 weeks old) weighing between 71 and 116 grams obtained from the departmental animal house were used. The animals were housed (5 rats to a stainless steel cage) in a well ventilated room and allowed free access to food and water. In addition to their food and water the experimental group was fed 1ml of an aqueous cocoa suspension each day for 48 days by force feeding / oral gavage.

The cocoa suspension was prepared by dissolving about four teaspoonfuls of Venaco natural cocoa powder in 1L of water and mixed thoroughly. The resulting suspension was kept in a refrigerator and various portions were taken daily, brought to room temperature and given to the animals as described earlier. The control animals were given the same volume of water over the same period by the same method

same method.

Blood sampling

Approximately 1mL of blood was drawn from the tail vein of the rats under ether anaesthesia. Blood was allowed to clot and centrifuged to obtain haemolysis-free serum which was used for biochemical analyses which required serum. About 0.5mL blood was also collected into vials containing EDTA and used as specimen for haematological analyses which required whole blood.

Biochemical analyses

Biochemical parameters were investigated at the University of Cape Coast Hospital Laboratory, using a Biolabo Diagnostic Auto Analyzer (Biolabo Diagnostics) from Kenza Biochemistry, France. The haematological indices were evaluated using a fully automated ABX, PENTRA equipment from Horiba Abx Diagnostics also at the University of Cape Coast Hospital Laboratory. Baseline determinations were made on the blood samples from a random selection of animals before they were put into the respective treatment groups.

Data analysis

All the data for the biochemical parameters and haematological indices were compared for differences or otherwise between experimental and control groups after the 48 day period, using ANOVA. Results presented are the means ± standard error of the mean (n = 6 in all cases).

Results

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Table 1, which presents data on the biochemical investigations, shows a significant 25.4% decrease in the total cholesterol of the experimental as compared to the control, a 32.1% decrease in LDL-cholesterol of experimental as against the control, and a 15.7% decrease in the triglycerides of experimental with respect to the control. Differences observed in other parameters were not significant.

Table 1
Values obtained for the biochemical parameters

Table 2 has data on the haematological determinations made, and indicates a significant 27.6% increase in white blood cells of experimental over the control, a 35.1% increase in platelets of experimental over control, and a further 8.76% decrease in the red blood cells of experimental compared to the control rats. Differences in the other parameters were not significant

Differences in the other parameters were not significant.

Table 2
Values obtained for haematological parameters.

Discussion

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The present investigation has provided information on some biochemical and haematological effects that have resulted from the administration of natural cocoa powder to rats. The highlights include the significant reductions in total cholesterol, LDL-cholesterol and triglycerides. Further, there were significant increases in white blood cell and platelet counts.

The significant decrease in the total cholesterol levels of the experimental rats (Table 1) may have resulted from the antioxidant properties of the polyphenols in cocoa.[15] These antioxidants have the ability to increase the synthesis of nitric oxide which has the ability to cause vasodilation, resulting in the clearance and prevention of the deposition of excess cholesterol in the blood vessels.[16] The beneficial effects of nitric oxide modulation include the regulation of blood pressure, lowering of NO-affected hypercholesterolemia and monocyte adhesion, all of which are involved in the progression of atherosclerosis.[16]

The non-significant difference in total plasma protein indicated that cocoa has little or no effect on total plasma protein concentration. Since plasma proteins are produced in the liver, these results thus indicate that the administration of cocoa does not affect this aspect of liver function.

Although uric acid levels of both experimental and control animals were elevated above that of the baseline values by the end of the treatment period, the difference between the experimental and the control group was not significant. This suggests that cocoa has no effect on the uric acid turn over.

Although a high level of uric acid is known to cause gout, uric acid or (urate) also plays a beneficial role by acting as a potent antioxidant.[17] Urate is a very efficient scavenger of highly reactive and harmful oxygen species which include hydroxyl radicals, superoxide anion, singlet oxygen and oxygenated heme intermediates in high valence states.[17]

The significant decrease in the LDL-cholesterol (Table 1) of the experimental group indicates a possible modulation by cocoa on LDL-cholesterol. Flavanols in cocoa are able to cause the modulation and prevent the oxidation and increase in LDL-cholesterol, which could put a subject at a higher risk of coronary heart

disease.[18,19] This prevention of the oxidation of LDLcholesterol is related to the mechanism of protecting the heart against heart disease. Since low levels of blood triglycerides help prevent diseases like stroke and hypertension, the reduced blood triglycerides observed, will enhance a healthy living. Stearic acid which is a saturated fatty acid abundant in cocoa is easily converted to oleic acid - a monounsaturated fatty acid, which thus causes no health problem.[20]

Stearic acid is also reported to cause the reduction of plasma cholesterol by limiting its absorption and enhancing the excretion of endogenous cholesterol.[21]

Dietary stearic acid reduces cholesterol absorption and increases endogenous cholester [J Nutr. 2000]

Daily cocoa intake reduces the susceptibility of low -density lipoprotein to oxida [Free Radic Res. 2001]

Over the period of administration of cocoa to the experimental animals, no significant changes were observed in the levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST) and alkaline phosphatase (ALP). Alanine aminotransferase, aspartate aminotransferase and alkaline phosphatase are used to identify hepatocellular disease, evaluate hepatocellular and cardiac disease and to detect and monitor diseases of the liver or bone respectively.[15] Injury or disease affecting these vital organs results in the release of these enzymes into the bloodstream, thus elevating their levels. It is seen that the treatment did not affect these serum enzyme levels meaning that the administration of cocoa had no detrimental effect on the functioning of the organs involved.

Although cocoa is known to contain appreciable amounts of iron, there was a significant reduction in the red blood cells of the experimental animals (Table 2). Absorption of iron from cocoa which is a (nonheme iron source) is not high, since the absorption of non-heme iron is less efficient as compared to heme iron sources.[22] Also, polyphenols are known to decrease absorption of nonheme iron.[23] The addition of pork or meat to a diet enhances the absorption of nonheme iron.[24] The effect on the red blood cells notwithstanding, haemoglobin levels were not significantly affected. Perhaps a more prolonged intake of cocoa could have an effect that may be worth further investigation.

Meat consumption in a varied diet marginally influences nonheme iron absorption i [J Nutr. 2006]

Green tea or rosemary extract added to foods reduces nonheme-iron abso [Am J Clin Nutr. 2001]

Nonheme-iron absorption from a phytate-rich meal is increased by the addition o [Am J Clin Nutr. 2003]

The significant increase in white blood cells of the experimental rats meant that the administration of cocoa could boost the immune system, since these cells are the most important cells responsible for the protection and fighting of infection. This supports and explains an earlier observation by Addai[25] that cocoa promotes superlative health by strengthening the immune system. Cocoa powder prevents many diseases particularly viral ailments.[25]

Polyphenols in cocoa are known to inhibit the activation of platelets.[9] Increased platelet count (thrombocytosis) may be seen in individuals who may not show any significant medical problems, while others may have a more significant blood problem. Some subjects with an increased number of platelets may have a

Dietary flavanols and procyanidin oligomers from cocoa (Theobroma cacao) ir [Am J Clin Nutr. 2003]