

ATTN:
Ms. Victoria Lutwak and
Ms. Felicia Satchell
Re: NDI Notification
Food and Drug Administration
Center for Food Safety and Applied Nutrition
5100 Paint Branch Parkway
College Park, MD 20740-3835

Hoodia Gordonii

New Dietary Ingredient Notification
(under 21 C.F.R. Sec. 190.6)

Submitted on: March 23, 2004

Submitted by: Mark Tahiliani
President and CEO
Awareness Corporation
25 South Arizona Place, Suite 500
Chandler, AZ 85225

New Dietary Ingredient Notification

For Hoodia Gordonii

Introduction and Background

This New Dietary Ingredient (“NDI”) Notification is submitted pursuant to 21 C.F.R. § 190.6 and Section 8 of the Dietary Supplement Health and Education Act. This Notification concerns the new dietary ingredient Hoodia Gordonii (“Hoodia”), a succulent in the cactus family that is native to South Africa which has been eaten as a food by the San Tribe there for centuries. Awareness Corporation (“Awareness”), a Nevada corporation located in Chandler, Arizona, proposes to use Hoodia in a dietary supplement to suppress the appetite. Currently, in its research and development for a dietary supplement containing Hoodia, Awareness has simply started with the flesh of the cactus Hoodia Gordonii and dehydrated it, producing a powder. The Hoodia powder is not chemically altered from the Hoodia plant flesh in any way. In the proposed product, this dried Hoodia powder will be used, in amounts of 300 mg per serving and 600 mg per day, in a dietary supplement for adults, for weight loss.

In terms of the safety evidence presented in this Notification, Awareness has concluded that Hoodia at the amounts above has a reasonable expectation of safety based on the following documentation and scientific evidence: 1) use as a food in South Africa in serving sizes of 35 g or more; 2) use as a food in South Africa for hundreds of years; 3) the proposed new ingredient is not chemically altered from the Hoodia plant, which has this well-established safe food use; 4) animal studies showing no toxicity and no abnormalities; 5) a nutritional analysis showing safe use and nutritional, beneficial minerals in Hoodia; and 6) a human clinical trial with no reported adverse events.

Botanical Description of Hoodia

In layperson's terms, the Hoodia gordonii plant has been described as a light green cactus covered in thorns, and roughly the same size and shape as a cucumber.¹ It is a slow-growing plant that requires temperatures of 50-61°F in order to grow.² The Hoodia plant is native to the Kalahari Desert region of Southern Africa, and is considered food by the San Tribe (or San), who call it Xhoba.³

Botanical Basic Data of hoodia: Hoodia cactus, Hoodia Gordonii Botanical
Source: Hoodia cactus, Hoodia Gordonii; Hoodia Gordinii cactus;
Scientific Name: Hoodia gordonii Sweet, Opuntia dillenii (Ker Gawl.) Haw.
Common Names: hoodia
Synonym: Cactus dillenii, Opuntia stricta var. dillenii, Opuntia anahuacensis,
Opuntia atropensis, Opuntia melanosperma, Opuntia nitens, Opuntia zebrine
Family: Asclepiadaceae
Part Used: stem plant of Hoodia Gordonii cactus Family: Asclepiadaceae
(Cactaceae)
Recommended Temperature Zone: USDA: 10-11
Frost Tolerance: Hardy to 28° F (-2° C) Sun Exposure: Light shade, morning sun
Origin: Southwestern Africa or other desert living circumstance.
Growth Habits: Succulent, forming clumps of 12 inches tall, 12 inches wide (30
by 30 cm)
Propagation: Cuttings Hoodia Cactus is a succulent in the family Asclepiadaceae.
It forms multi-stemmed clumps 45cm (18 in) high and bears unpleasant-smelling,
pale purple disc-shaped flowers 7.5-10cm (3-4 in) in diameter. . . .

The Hoodia plant Hoodia is a genus in the Asclepiadaceae family. There are approximately 20 species in the genus. The unusual flowers are flat and saucer-like in shape and red, purple to brown or mottled dark yellow in colour. Flowers form prolifically near the stem tips in summer. The short stems are many angled with white spikes appearing at short intervals on each angle. Stems are single or

¹ Kraft, Dina. Bushmen, drug giant battle over royalties. Toronto Star (Canada), August 24, 2002, p. A 18 ("Kraft").

² The Hoodia Plant, Botanic-Art, p. 1 of 2, at www.botanic-art.com/hoodia.htm ("Botanic-Art"). Also, please see pictures of the Hoodia gordonii plant in Hoodia, Pseudolithos and Larryleachia (Trichocaulon), Cactus and Succulent Society of Israel, Feb. 3, 2004, at <http://www.cacti.co.il/htm>.

³ Kraft.

branch forming, they occur in variable shades of green. Plants are found in a large part of Southern Africa, also other desert living circumstance.⁴

Conditions of Use in the Proposed Product

This ingredient is to be used in a dietary supplement for healthy adults, for weight loss. Specifically, Hoodia is to be included as an appetite suppressant. Awareness will start with the flesh of the Hoodia cactus, dehydrate it, powder it, and use it in a multi-ingredient dietary supplement. The Hoodia ingredient thus would be chemically identical to the flesh or pulp of the Hoodia cactus plant (which is consumed as a food), but simply with the water removed. The proposed Awareness product would contain this dried Hoodia at the amount of 300 mg per serving, with the Suggested Use as two servings per day, and thus an amount of 600 mg per day. The label will contain three Cautions, prominently printed in bold type: **Not for children under 18. Do not exceed recommended serving size. Do not use if you are pregnant or lactating.**

Disclosures and Disclaimers: Please note that while there is evidence of therapeutic properties of Hoodia in the botanical and medical literature, and also of medicinal traditional use of Hoodia among the San Tribe (e.g., for asthma, stomach aches, etc.), no medical or therapeutic use claims will be used in the labeling or the advertising of the proposed Awareness product. Finally, there are also reports in the news media that Hoodia has been traditionally used in South Africa for sexual energy or as an aphrodisiac. However, Awareness will make no such claims for its proposed dietary supplement containing Hoodia.

As shown below, an “active” constituent, called P57, has been extracted from the Hoodia plant and is being developed for an anti-obesity drug.⁵ However, the NDI Hoodia that is the

⁴ Derrida, Michael, What is Hoodia? Mechanism of Hoodia Extract's Work? Hoodia Cactus, the new Weight Loss Miracle? Where to Source Hoodia Cactus P.E.?, Romania Trade Forum, January 22, 2004; http://www.teleactivities.net/_trade/00000084.htm.

subject of this Notification is a botanical ingredient, as described above, is not an extract, and is not to be used to treat obesity. The only claims to be used on the Awareness product label will be structure/function claims for reducing appetite, and such appetite suppressant claims will be in the context of a sensible diet and moderate exercise.

Safe Use of Hoodia as a Food for Centuries: Historical Use

More than twenty news articles published in the last three years have reported on and documented the use of Hoodia cactus as a food in South Africa, and that this food use has occurred for generations, and probably for centuries.⁶ The Hoodia plant, the Hoodia Gordonii Succulent, is indigenous to the South Africa region and long known by the San Tribe people to assuage thirst and hunger,⁷ specifically as an appetite suppressant.⁸ The Hoodia plant was discovered by the San Tribe and used by them, perhaps since prehistoric times. The San Tribe can trace their heritage back 27,000 years, and there is good evidence that they have known

⁵ See, e.g., Henderson, Mark. Cactus pricks obesity problem. The Times (UK), April 12, 2001, p. 17. Hawthorne, Peter. The Hunter-Litigators: Southern Africa's San tribes are challenging the right of commercial interests to profit at their expense. NewsBank InfoWeb, NewsBank Public Library Collection, Time International, August 6, 2001, p. 30.

⁶ Foley, Stephen. Phytopharm to extend trials of obesity drug. The Independent (London), April 12, 2002, p. 25.

⁷ LeBreton, Gus. Trade in Biological Resources in Southern Africa, July 31, 2001, presented to the Multi-Stakeholder Dialogue on Trade, Intellectual Property Rights and Biological Resources in Eastern and Southern Africa.

⁸ Gillespie-White, Lee and Garduno, Eric. Treading an Independent Course for Protecting Traditional Knowledge, April 2002, International Intellectual Property Institute.

about the properties of Hoodia for thousands of years.⁹ They chewed the bitter Hoodia twice a day to suppress hunger and thirst during long hunting trips.¹⁰

The reported duration of this traditional use of Hoodia is varied. Some sources report that the San communities of South Africa have been using Hoodia cactus to stave off hunger and quench thirst for thousands of years.^{11, 12} “To stave off the worst of hunger pains during the trips across the infertile lands, they chewed the Hoodia. They’ve been eating this for thousands of years...”¹³ However, other sources report that the Hoodia plant has been used for centuries by the San bushmen,^{14, 15} while other sources report that the Hoodia plant has been used for appetite suppression for generations.¹⁶ For example, one bushman of the San Tribe, David Kruipeir, 67, said that during long hunting trips in the desert, his grandfather gave him the pulp of the hoodia

⁹ Hoodia Gordonii: Miracle cactus or another fly trap?, <http://www.dolfzine.com/page612.htm>, page 2 of 7 (undated).

¹⁰ Lose Weight-The Natural and Healthy Way. <http://www.rebirth.co.za/weight loss hoodia gordonii.html>; and History of Africa the True Story. <http://www.rebirth.co.za/history of Africa.html>.

¹¹ Appetite Suppressing Hoodia Cactus., MedPlant, Medicinal Plants Network, <http://www.source.bellanet.org/medplant/article.php?sid=31>.

¹² Barnett, Antony. In Africa the Hoodia Cactus Keeps Men Alive. Now its Secret is ‘Stolen’ to Make Us Thin, June 17, 2001, The Observer. <http://www.education.guardian.co.uk/print/0,3858,4205467-102275,00.html>.

¹³ Mangold, Tom. Magic Molecule . . . and the Millionaire Bushman, The Age, June 23, 2003. <http://www.hoodiacactus.info>.

¹⁴ Kalahari Cactus Boosts UK Drug Firm, July 30, 2002, BBC News World Edition. <http://www.news.co.uk/2/hi/business/2161194.stm>.

¹⁵ Pride, Kimberly. The San, NewsBank, Public Library Collection (Faces section), February 1, 2003, Vol. 19, Issue 6, page 16.

¹⁶ S. African Bushmen Hail Drug Deal, March 24, 2003, BBC News World Edition. <http://www.news.bbc.uk/2/hi/Africa/2883087.stm>.

cactus to stave off both hunger and thirst.¹⁷ Even “mere” generations of use as a food demonstrates at least a reasonable expectation of safety.

Traditionally, the tribesmen would cut off a stem of the cactus about the size of a cucumber and eat it over a period of a couple days. One San bushwomen stated, “All the San people here use the xhoba [Hoodia], and in Namibia they give it to their dogs to eat when they are hungry. In the old days the men often went three days in midsummer without food or water when they were hunting, and they never felt hungry or thirsty.”¹⁸

Other groups in Africa, besides the San Tribe, have ingested the Hoodia plant for medicinal purposes:

The Haioms of northern Namibia still use Hoodia sap to treat allergic reactions in the eyes, and to treat severe stomach pain they boil Hoodia pieces in water and drink the brew. The Anikhwe of northern Botswana feed children who “eat too much” pieces of Hoodia to make them eat less. Already decades ago[,] obese members of the Khomani community of northwestern South Africa were eating the Hoodia to slim down or to maintain a high energy level.¹⁹

The use of the Hoodia plant, principally by the South African San communities--as food, as water, as an appetite suppressant, and for energy--has been commonly known for some time. This knowledge led government researchers to isolate the active ingredient from the rare succulent and patent this active ingredient as a potential diet drug²⁰ (called P57 and developed by

¹⁷ Kraft.

¹⁸ Evans, Gavin. The Diet Secret of the Desert, The Times (United Kingdom), November 19, 2002.

¹⁹ Botanic-Art, p. 1 of 2.

²⁰ Lund, Cathy. San to Cash in on Diet Drug Deal, Sunday Times (Africa), November 18, 2001. http://www.sundaytimes.co.za/2001/11/18/news/news_09.asp.

a UK company named Phytopharm).²¹ Several early sources reporting the use of Hoodia as an appetite suppressant led to this government research. “The curiosity of the South African Government’s Council for Scientific and Industrial Research (CSIR) in Hoodia was inspired by two sources: a 1937 research paper from a Dutch ethnobiologist who quoted Khomani hunters on the plant’s appetite-suppressing qualities; and information supplied to the military by Khomani trackers who also used it as a source of water.”²² In addition to these early sources reporting the safe consumption of Hoodia, the traditional use of Hoodia by the San bushmen and others to suppress appetite and stave off thirst is widely known and reported.

Recent Reports and Documentation of Safe Use

Over 200 interviews have been conducted with the San Tribe and some concerned the Hoodia plant.²³ The San Hunters have traditionally suppressed their hunger and maintained their energy levels on their two to three day hunting trips by eating a slice of Hoodia twice a day.^{24, 25} The San Tribe called this cactus *!khoba* and have been chewing on it for thousands of years to stave off hunger and thirst during long hunting trips in their home: the Kalahari desert, which is

²¹ Barnett, Antony. In Africa the Hoodia Cactus Keeps Men Alive. Now its Secret is ‘Stolen’ to Make Us Thin, June 17, 2001, The Observer. <http://www.education.guardian.co.uk /print /0,3858,4205467-102275,00.html>.

²² Evans, Gavin. The Diet Secret of the Desert, The Times (United Kingdom), November 19, 2002, p. 6 (“Evans”).

²³ Geingos, Victoria and Ngakaeaja, Mathambo. Traditional Knowledge of the San of Southern Africa; Hoodia Gordonii, presented at Second South-South Biopiracy Summit: “Biopiracy—Ten Years Post Rio” 22-23 August 2002, Johannesburg, South Africa (“Geingos and Ngakaeaja”).

²⁴ Geingos and Ngakaeaja.

²⁵ Hawthorne, Peter. The Hunter-Litigators Southern Africa’s San Tribes are Challenging the Right of Commercial Interests to Profit at Their Expense, Time International, August 6, 2001.

both parched and scorched.²⁶ “Hunters would cut a slice of Hoodia, munch it, and within minutes hunger and thirst would evaporate, leaving a feeling of strength and alertness. They could travel for days eating nothing else.”²⁷

Some personal accounts of the use of Hoodia have also been reported recently. Specifically, on a trip to South Africa, Tom Mangold, a BBC Two correspondent, reported that he drove into the desert, four hours north of Capetown, to personally locate and test the effects of the Hoodia plant.²⁸ After peeling off the spikey outer layer, he ate about a half a banana sized piece of Hoodia without experiencing any adverse side effects. Mr. Mangold also reported that the San Bushmen of the Kalahari have been eating the Hoodia plant for thousands of years to stave off hunger. One San hunter said of Hoodia: “I learned it from my forefathers. It is my food, my water, my medicine,”²⁹ while another, Piet Rooi, stated, “I’ve been eating it since I was nine”; he is now 73.³⁰ It is clear that for a significant period of time Hoodia has been safely consumed by the San bushmen (to stave off hunger and thirst), and thus should be considered a safe food and a safe dietary supplement ingredient. Beyond having a reasonable expectation of safety (the standard for an NDI), Hoodia as consumed in South Africa, and as documented in this Notification, has an actual safety record spanning hundreds of years.

²⁶ Marshall, Leon. Africa’s Bushman May Get Rich from Diet-Drug Secret, National Geographic News, April 16, 2003. http://news.national_geographic.com/news/2003/04/0416_030416_San1.html

²⁷ Carroll, Rory. It’s green, prickly and sour, but this plant could cure obesity and save an ancient way of life, The Guardian, January 4, 2003. <http://www.guardian.co.uk/medicine/story/0,11381,8516,00.html>, p. 1 of 6.

²⁸ Mangold, Tom. Sampling the Kalahari Cactus Diet, May 30, 2003, BBC News World Edition. <http://www.news.bbc.co.uk/2/hi/programmes/correspondent/2947810.stm>.

²⁹ KOMO Staff & News Services, New Wonder Diet Drug, KOMO TV News, August 10, 2003. <http://www.komotv.com/news/mnewsaction.asp?ID=26561>.

³⁰ Evans, Gavin. The Diet Secret of the Desert, The Times (United Kingdom), November 19, 2002.

While the Bushmen of the San Tribe have historically eaten the Hoodia during their hunting trips to the Kalahari Desert, contemporary reporters and scientists were skeptical.³¹

The educated city people [—] a government minister, a chief executive and several directors of the nation's most important scientific organizations—traveled at sunrise to this barren region of the Kalahari Desert to see for themselves the cactus that has been trumpeted as a natural wonder.

But when they stood before it, a puny cluster of spiny stalks that looked like wrinkled cucumbers, the magnitude of the moment escaped them.

“That’s it, huh?” asked Dr. Ben Ngubane, minister of arts, culture, science and technology. “How do you know this one is safe to eat?”

A grin from Petrus Valbooi, a leader of the San people, or Bushmen, who scrape life from this barren landscape, reassured the skeptics. He cut off a stalk, shaved off its spines, and sliced into its milky center, bidding them to taste.

That’s where its power lies, he told them. Indeed.

From a desert weed known as hoodia, one of the world’s oldest and least developed peoples hopes to enjoy its first taste of prosperity.

The San have sucked on hoodia for generations, principally to raise their energy and fight hunger during long hunting trips.³² [Emphasis added.]

A woman named Susanna Witbooi was reported as dethorning the Hoodia plant, and saying that she would then crush it into powder to treat her sister’s asthma.³³ These stories are not isolated anecdotes, but, rather (as shown above) collectively document a long history of food use and therapeutic use of Hoodia.

Tom Mangold, a reporter for the British Broadcasting Company (“BBC”), conducted a taped interview with the San people on June 1, 2003, during which a San Tribeswoman

³¹ Mangold, Tom. Magic Molecule . . . and the Millionaire Bushman, The Age, June 23, 2003. <http://www.hoodiacactus.info>.

³² Thompson, Ginger. Bushmen Squeeze Money from Humble Cactus, New York Times, April 1, 2003, p. A4.

³³ Evans.

described Hoodia as a great cure for illnesses. Mr. Mangold ate some Hoodia for himself and reported:

This was no clinical trial, but I have to say it worked one hundred percent for me and I neither worried about nor consumed food for some twenty four hours afterwards.

Roger Chennells, the attorney for the San Tribe in Africa, also reported eating the Hoodia Cactus with no adverse effects, and stated about its appetite suppressing characteristic:

I didn't eat for about sixteen hours after quite a small piece. And I felt really good as well. I didn't feel nauseous.³⁴

While these are simply anecdotal reports, they are part of the profile depicting a plant which has been and is safely eaten as a food, and thus reasonably expected to be safe in a dietary supplement.

Animal Studies on Hoodia

There have been several toxicology and animal studies of ingested Hoodia. In April 2001, at the Annual Meeting of the Professional Research Scientists on Experimental Biology held at the University of Sciences in Philadelphia, Dr. Orien Tulp, Jeremy Mihalov, Dr. Ara DerMarderosian, and Nevin Harbi reported their study on the ingestion of Hoodia in rats.³⁵ The researchers noted that South Africans have ingested the Hoodia plant for years in order to control appetite. In their study, young adult male rats were administered an homogenized dehydrated crude preparation from four species of Hoodia plant. After this preparation, a group of four rats were fed Hoodia as an aqueous slurry or as a semi-purified extract from equivalent amounts of crude homogenate. The ED50 [=Effective Dose for 50% of the population] for appetite

³⁴ The Anti-Fat Pill and the Bushman, reported by Tom Mangold, Transcript of British Broadcasting Company documentary, June 1, 2003, pp. 23-25.

³⁵ Tulp, Orien Lee, *et al.*, Effect of Hoodia Plant on Food Intake and Body Weight in Lean and Obese LA/Ntul//cp-rats, FASEB Journal, Vol. 15, No. 4, p. A404 (2001).

suppression in a four-hour feeding test ranged from 1.8 to 2.7 g of Hoodia per kilogram body weight per rat. (By contrast, the amount of Hoodia to be included in the proposed Awareness supplement is only 600 mg per day.) A control group of four rats were fed a normal diet. The study duration was approximately three weeks, and no adverse side effects were reported in the group of rats fed the Hoodia. Also, the researchers noted that this was the first report on the appetite suppressant effects of ingesting Hoodia.

A year later, at the April 2002 Annual Meeting of the Professional Research Scientist on Experimental Biology held at the London College of Medicine, Dr. Orien Tulp, Dr. Ara DerMarderosian, and Nevin Harbi reported their second study concerning the ingestion of Hoodia on rats.³⁶ The researchers again noted that Hoodia has been traditionally consumed by South Africans for endurance and to suppress hunger. In their second study, a group of six lean and six obese rats were fed a 2% (w/v) aqueous homogenate of dehydrated Hoodia. A control group of six rats were fed a normal diet. After a three week period, the rats were killed and analyzed, and no observable side effects were noted in the two groups of rats fed Hoodia.

In addition to the animal studies and historically known usage among the residents of South Africa, other studies have been performed on Hoodia to determine its nutritional value. Specifically, in the March 2001 Annual Meeting of Professional Research Scientists on Experimental Biology held at the University of Sciences in Philadelphia, Dr. Orien Tulp, Dr. Ara DerMarderosian, and Nevin Harbi presented their findings regarding the nutritional level of Hoodia.³⁷ The researchers again noted that Hoodia is often consumed by the local residents of

³⁶ Tulp, Orien Lee, *et al.*, Effect of Hoodia Plant on Weight Loss in Congenic Obese LA/Ntul //cp rats, FASEB Journal, Vol. 16, No. 4, p. A654 (2002)

³⁷ Tulp, Orien Lee, *et al.*, Mineral Content of Edible Hoodia Plant Species, FASEB Journal, Vol.15, No. 5, p. A971 (2001) ("Mineral Content").

regions of South Africa as a source of energy and nutrition. The researchers further stated that the nutritional content of Hoodia had not been previously studied.

As part of the study, clippings from the Hoodia plant were homogenized, dehydrated, and analyzed for mineral content. The researchers found that the carbon, nitrogen, and hydrogen amounts in Hoodia were consistent with a high carbohydrate, low fat content with a mean protein content of 5.9%. The mineral analysis of the Hoodia plant also revealed that it contained 6.5% Ca, 5.1% K, 0.3% P, 1% Mg, 1.9% Na, and 0.7% S, with smaller amounts of micro and trace minerals: Fe, Bo, Mn, Cu, Zn, Cd, Cr, Mo, Ni, As, and Se. The researchers concluded that the Hoodia analyzed contained significant proportions of the recommended or safe daily intakes of several micronutrients per serving. "A typical 35g serving may be obtained from a 250g portion of the whole plant, and could provide [greater than] 100% of the RDA for Ca (2.3g), 95% of the RDA for Mg (335 mg), 115% of the RDA for Na (670 mg), 65% of the recommended intake for K (1.8g), 43% of the RDA for Fe (6.5mg), and 60% of the RDA for Cr, plus significant proportions of other ultratrace elements." The researchers summarized their findings by concluding that Hoodia may "...provide a safe and important source of numerous essential minerals and energy, and may make important contributions to the micronutrient intakes of indigenous residents of the area." (Emphasis added.) Therefore, if a 35 gram serving size provides a safe and important source of essential minerals, then clearly, a 300 mg serving size and 600 mg per day amount (as in the Awareness proposed supplement), which are 50 to 100 times less, are safe amounts of Hoodia to ingest.

In an April 2002 meeting of the Annual Meeting of Professional Research Scientists on Experimental Biology held at the London College of Medicine, Dr. Tulp and Nevin Harbi again reported that the Hoodia plant has been consumed by residents of Southern Africa for many

years and that it has a sweet, pleasant taste that traditionally has been used to enhance endurance and physical stamina when consumed.³⁸ The researchers presented their scientific data regarding the nutritional value of Hoodia. In this study, several species of Hoodia were collected, dehydrated at low temperature, and analyzed for mineral content by atomic absorption spectrometry. The researchers reported that Hoodia contains "...nutritionally significant quantities of Ca, K, Mg, P, Na, Cr, Fe, Zn, Co, Mo, Ni, Bo, Mn, and Cu sufficient to meet the RDA with as little of 1-3 servings/day." Because of the high water content of Hoodia (greater than 50%), plus the levels of Ca and Mg, the authors reported that Hoodia "...can make an important contribution to the overall micronutrient intakes of the indigenous residents of the area."³⁹

Human Clinical Trial on Hoodia

The effects of Hoodia were first observed in 1937 by a Dutch anthropologist studying the San Bushmen of the Kalahari Desert. He noticed that they munched on the stem of a certain variety of Hoodia plant as an appetite suppressant and thirst quencher before and during nomadic hunts in the sparsely vegetated area.⁴⁰ A second source of interest in this cactus came from "information supplied to the military by Khomani trackers who also used it as a source of water."⁴¹ Hoodia apparently was neglected, in terms of scientific research, for over 30 years, until the 1980s. Then some South African scientists at the Council for Scientific and Industrial

³⁸ Tulp, Orien Lee, and Harbi, Nevin A., Hoodia Species as a Source of Essential Micronutrients. FASEB Journal, Vol. 16, No. 4, p. A648 (2002).

³⁹ Tulp and Harbi (2002).

⁴⁰ Hoodia Gordonii: Miracle cactus or another fly trap? <http://www.dolfzine.com/page612.htm>, page 2 of 7 (undated, but after June 2003 which is referenced in this article).

⁴¹ Evans.

Research studied Hoodia by feeding lab animals the flesh of the Hoodia cactus: they lost weight, but otherwise suffered no ill effects.

In the first human clinical trial, 15 days after the study began, the Hoodia group (19 extremely overweight people) had reduced their caloric intake by 1,000 calories a day and suffered no ill effects.^{42 43} Specifically,

When the first human clinical trial was conducted by Phytopharm, the company chose a morbidly obese group of people from Leicester, England, and placed them in a “phase 1 unit”, a place as close to prison as it gets. All the volunteers could do was read papers and watch television - and eat. Half the group were given Hoodia, half were given placebo. At the end of 15 days, the group on Hoodia had reduced their food intake by 1000 calories a day. Given the average daily diet is around 2200 calories, this was a stunning success.⁴⁴

We were unable to acquire a copy of the article documenting this study commissioned by Phytopharm (most probably because this article is considered confidential, proprietary information by Phytopharm, as perhaps was published only as an in-house report), but there were no reports of any adverse events during this trial.

Conclusion of Reasonable Expectation of Safety

Under 21 C.F.R. § 190.6 (a), the standard for a new dietary ingredient premarket Notification is that the manufacturer present the basis on which it has concluded that “a dietary supplement containing such dietary ingredient will reasonably be expected to be safe.” In this Notification, we have documented a reasonable expectation of safety for a dietary supplement containing Hoodia Gordonii (Hoodia), at the amount of 600 mg per day, and 300 mg per serving,

⁴² Hoodia Gordonii: Miracle cactus or another fly trap?, p. 2 of 7.

⁴³ Stummer, Robin, The Pill-Free Fat-Busting Machine, The Independent (London), September 7, 2003.

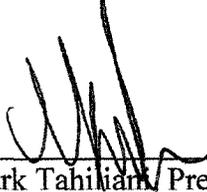
⁴⁴ Mangold, Tom. Magic Molecule . . . and the Millionaire Bushmen, The Age, June 23, 2003. <http://www.theage.com.au/articles/2003/06/22/1056220476331.html>.

in the following ways: 1) Hoodia has been consumed by the San Tribe in South Africa for centuries at a serving size of 35 grams; 2) the Hoodia in the proposed product is chemically identical to the cactus flesh that has this long-term safety record as a food; 3) animal studies show no toxicity; and 4) clinical trials on rats and humans demonstrate no mortality or toxicity, no adverse events, and indicate safety. Copies of all articles and reports cited herein are attached,⁴⁵ pursuant to 21 C.F.R. § 190.6 (b)(4). Together, these articles and reports, in conjunction with the facts, data, and analysis above, demonstrate that a dietary supplement containing Hoodia at a level of 600 mg per day, and under the conditions of use described above, will reasonably be expected to be safe.

⁴⁵ Organized in alphabetical order by author (or by first word in the title if no author is provided).

Note on Confidentiality

In order to present full background on this NDI, this Notification contains some proprietary information and trade secrets of Awareness, and thus is the Confidential version of the submission. Pursuant to 21 C.F.R. § 190.6 (e), Awareness, through its counsel, Susan Brienza, of Patton Boggs LLP (Denver Office), reserves the right to redact all commercial confidential, proprietary and trade secret information within 90 days of this filing, and to provide that redacted version to this office, before the Notification is publicly displayed or added to the FDA's public Docket.

By: 
Mark Tahilian, President and CEO
Awareness Corporation

Date: March 22, 2004