

Docket No. 874-003

TRADEMARK

NOTICE OF APPEAL TRANSMITTAL LETTER

In re Application of: Milo Shammass

Serial No. 77/758,863

Filing Date: June 12, 2009

Mark: PROBIOTIC

Commissioner for Trademarks

P.O. Box 1451

Alexandria, VA 22313-1451

In connection with the above-referenced trademark application,
please find the following:

- 1) Notice of Appeal
- 2) Appeal Brief
- 3) Check No. 3594 in the amount of \$100.00

The Director is hereby authorized to charge the required fee, any
deficiency, or credit any overpayment, to Deposit Account No. 50-3946.

Law Offices of Sandy Lipkin
P.O. Box 3518
Ventura, CA 93006-3518

Respectfully submitted,


Sandra Lee Lipkin

Reg. No. 47,617

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VA 22313-1451 on

Date: 10/12/11By: 

Saylor Guilliams



10-18-2011

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	Trademark Attorney:
Milo Shammass	)	Sara N. Benjamin
	)	Law Office: 110
Serial No. 77/758,863	)	Docket No.: 874-003
Filed: June 12, 2009)	
)	
Mark: PROBIOTIC	)	Date: October 7, 2011

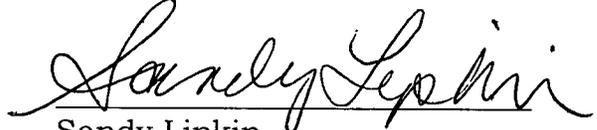
NOTICE OF APPEAL (EX PARTE)

Commissioner for Trademarks
P.O. Box 1450
Alexandria, VA 22313-1450

Notice of Appeal to the TTAB

Applicant hereby appeals to the Trademark Trial and Appeals Board from the Decision of the Examiner of Trademarks refused registration.

Respectfully submitted,


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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

In re Application of:	)	Trademark Attorney
Milo Shammass	)	Sara N. Benjamin
	)	Law Office: 110
Serial No. 77/758,863)	
Filed: June 12, 2009	)	Docket No.: 874-003
)	
Mark: PROBIOTIC	)	Date: October 7, 2011

APPLICANT'S APPEAL BRIEF

1.0 Introduction.

Pursuant to the Notice of Appeal filed concurrently herewith, the Applicant has appealed the Trademark Examining Attorney's refusal to register Applicant's mark PROBIOTIC for soils and fertilizers on the Section 2(e)(1) ground that it is generic or in the alternative that it is merely descriptive.

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2.0 Relevant Facts.

Applicant has applied for the mark PROBIOTIC for use with soils and fertilizers based on in-use in commerce and interstate commerce at the time the application was filed. The record shows that Applicant has been using the mark in interstate commerce since at least July 12, 2000. The record also shows that the Applicant conceived of the use of the word with regard to his goods as early as 1992 when he commissioned the design of a logo. The record also shows that Applicant owns a California registration for the mark with use of the cited goods that was granted in 2001.

Prior to Applicant's use of the mark for the goods cited, the word was not commonplace at all and was not associated in the public's eye with soils and fertilizers. Through continued use and goodwill, the mark has now become a recognized mark with fertilizers and soils produced by the Applicant. Evidence of record shows that this association originated with the Applicant's use.

3.0 Applicant's Argument.

The Examiner asserts, and Applicant strongly disagrees, that the mark is generic and/or descriptive and therefore unregistrable. Additionally, the Examiner also asserts that a term once arbitrary or suggestive may lose its distinguishing and origin-denoting characteristics through use in a descriptive sense over a period of time, and may come to be regarded by the purchasing public as nothing more than a descriptive designation with expressly arguing facts in this case that this rule applies to Applicant, yet implying same. The implication here by the Examiner that even if the mark were not generic or descriptive based on Applicant's arguments, it has been genericized from a once arbitrary and suggestive status to a descriptive designation.

The Examiner has rejected Applicant's arguments and evidence that show that the mark is neither generic nor descriptive, ultimately concluding that despite Applicant's origination of the term with regard to the goods and services cited, the mark is not registrable either 1) because it is generic or descriptive or 2) because of the association of the word

with the goods and services cited with widespread use over time has created a term used by the general public as a synonym for the goods and services.

Furthermore, in the final Office Action the Examiner asserts that Applicant has failed to show that the purchasing public regards Applicant's mark not as a merely descriptive or generic term for the identified goods, but rather as an indicator of origin.

3.1 Summary of Applicant's Argument.

Applicant asserts that the mark is neither generic nor descriptive in that the commonly understood definition of the word does not apply to additives to soils and fertilizers. Hence, because the definition of the word is not associated in any way with soils and fertilizers, it cannot be found to be descriptive of generic relative thereto. Furthermore, Applicant's continued use of the word with regard to soils and fertilizers has not genericized the word to the point that it has become a synonym with the goods and services.

3.2 Generic Refusal.

The two-part test for a determination of whether or not a mark is generic is as follows:

- 1) what is the class of goods at issue; and
- 2) does the relevant public understand the designation primarily to refer to that class or genus of goods and/or services?

The Examiner has cited repeatedly in the prosecution record that the wording PROBIOTIC in the mark means “substance containing beneficial microorganisms.” Further she has shown evidence of use of the word in fertilizer products. Applicant’s argument is that 1) the definition provided by the Examiner is not the prevailing one and 2) any association of the term with fertilizers did not exist prior to Applicant’s use of it.

It is Applicant’s position that the mark is not generic in that the definition of the word does not even define goods a propos to Applicant’s use with cited goods. Furthermore, prior to Applicant’s first use of the mark in 1992 (See Exhibit A, which is a copy of an invoice to Applicant for creation of the mark in 1992), the word PROBIOTIC did not have any association with fertilizers at all. Even as of the date of this writing, the word is associated with the guts of living organisms and not fertilizers. In fact, a recent Wikipedia entry defines PROBIOTIC as “live microorganisms which when administered in adequate amounts confer a health benefit on the host.” (See Exhibit B) There is no mention, as of the date of April 5, 2011, of the use of probiotics as fertilizer, despite its popularity in the industry that was originated by Applicant.

Further, the previously submitted statement from Mike Amaranthus, Ph.D., who is the president of Mycorrhizal Application, Inc., and is considered to be the leader in soil inoculants across America provides an expert opinion that it is the Applicant that first introduced

the use the of word PROBIOTIC to the lawn and garden industry and that prior to that, it was never used, nor had he heard it used other than for animal feed or human supplements, i.e., as a oral supplement for beings with digestive systems. Dr. Amaranthus credits the Applicant for his work in popularizing this word in this class of goods and services. (See Exhibit C).

The Applicant first began to use the word PROBIOTIC to differentiate his technology, since he was the first in America to infuse beneficial soil microbes and mycorrhizal fungi with organic fertilizers and soils in 1989. (See Field Trial and Efficacy Report, Exhibit D) Applicant needed to identify this technology and he chose the word "PROBIOTIC" because it literally means "for life," and that is just what the newly found technology was, a for-life product. PROBIOTIC needed to have a brand identity that created a clear and separate difference from already existing soils and fertilizers on the market, and this was the brand name to identify it.

Applicant strongly and respectfully asserts that the relevant public does NOT understand the designation of the word "probiotic" to refer to the class or genus of goods at issue, which are soils and fertilizers. While the Examiner may have a point about the genericness of the word "probiotic" relative to its use to describe live organisms ingested for the benefit of the intestinal health of a host consuming such organisms, the use of the word to describe live organisms in soils and fertilizers is not

considered generic in that the general public does not relate organisms described in oral supplements designed to aid in the intestinal health of living organisms with additives to soils and fertilizers.

Attached hereto and marked as Exhibit H is an internet print-out of Merriam-Webster's dictionary definition of probiotic, which is "a preparation (as a dietary supplement) containing live bacteria (as lactobacilli) that is taken orally to restore beneficial bacteria to the body; also a bacterium of such a preparation."

As this definition demonstrates, as far as the general public is concerned, the word probiotic refers to an orally taken supplement to the body to restore beneficial bacteria. Nowhere in this definition is there any mention of the use of such bacteria in soils and fertilizers as that use is unique to Applicant's use of the word to describe ingredients added to his soils and fertilizers. This word-goods association is not made by the general public upon hearing the word "probiotic." Furthermore, there is no correlation to any organisms referred to as probiotic that promote intestinal health to any organisms added to soils and fertilizers for the creation of more fertile medium in which to grow flora.

Referring back to Exhibit B, it can readily be read from this entry, as understood by the relevant public, that "probiotic" refers to "live microorganisms thought to be beneficial to the host organism...[that] confer a health benefit on the host." The relevant public understands "probiotic" to be a nutritional supplement ingested by a host organism

that is then conferred a health benefit. More specifically, as the Wikipedia entry goes on to state, the word “probiotic” is associated with oral supplements that provide health improvements for the alleviation of chronic intestinal inflammatory disease and other disorders of the gut. All of this leads to the understanding of the generic use of the word “probiotic” to refer the oral ingestion of organisms by a host organism that has both a mouth and a gut.

Applicant’s use of the word “probiotic” in his soils and fertilizers involves no host organism with neither a mouth or a gut. Accordingly, the relevant public would not associate the word “probiotic” as it is generally understood to have anything at all to do with soils and fertilizers. Hence, since “probiotic” as understood by the general public involves the ingestion of living organisms by a host with a mouth and a gut, the use of the word with regard to soils and fertilizers is neither generic or descriptive since it does not describe applicant’s goods in any way.

3.3 *Descriptiveness Refusal.*

Originally, Applicant’s mark was rejected as descriptive with the possibility of being generic. All of the arguments against genericness apply against descriptiveness. Additionally, assuming for the purposes of argument the word were descriptive of Applicant’s goods, due to its continued use and common law trademark rights claimed and state trademark laws granted with regard to the word, there should be a

strong presumption in Applicant's favor that the word has acquired distinctiveness particularly to Applicant's goods. In the same way that in the semiconductor industry, Intel, the leader of the industry, uses the two words "Intel Inside" to identify its brand inside of many computer brands, the word "PROBIOTIC" has become distinct with its identification with Applicant's brand specifically and not with soils and fertilizers generally.

However, it is Applicant's repeated argument that the word is not even descriptive of Applicant's goods, evidenced by the previously cited evidence under the argument against genericness.

In further support of the origins of the use of soil microbes in fertilizer and the subsequent use of the word PROBIOTIC for its literal meaning and not for the meaning it has come to hold in the eyes of general public, mostly with regard to foods ingested by humans animals, please find articles written by the Applicant in 1996 and 1992, Exhibits E and F, respectively. Also, submitted as Exhibit G is a specimen of the mark in use that Applicant asserts dates back to 1992.

Further, Applicant's amendment to make the Section 2(f) claim was not an admission that the word was generic or descriptive of Applicant's goods. Rather, it was amended to provide evidence that the mark has become associated with Applicant's goods since its use in connection with soils and fertilizers and not an admission that the mark was either generic or descriptive.

3.4 *Genericized*

The Examiner asserts without any factual support relative to this particular application that the association of the word with the goods and services cited with widespread use over time has created a term used by the general public as a synonym for the goods and services. This refers generally to the genericization of marks wherein a trademark or brand name has become the colloquial or generic description for, or synonymous with, a general class of product or service, rather than as an indicator of source or affiliation, i.e., secondary meaning, as intended by the trademark's holder.

Since the general public defines the term "probiotic" to refer to oral supplements that aid in digestion, the argument that the word has become so associated with soils and fertilizers to have become genericized fails. The fact that other soil and fertilizer producers have co-opted the phrase due to Applicant's success in the industry does not render the term generic for the goods and services. Applicant has been using the mark for over ten years and has a registered California trademark for the word.

As a matter of note, but not on the prosecution record, Applicant has applied for and received a federal registration for the mark PREBIOTIC (Reg. No. 3,895,671) which refers to the precursor elements

providing food for probiotic elements in any composition. It is expected that this mark will attain the same amount of popularity in the industry as PROBIOTIC has and where one is (probiotics), the other (prebiotics) must be. In the interests of equity, it is not fair to penalize Applicant for the success of the mark to the point that others in the industry have tried to appropriate it. The passage of time and success have made the mark identifiable as Applicant's, as shown in the record, evidenced by Exhibit C. Nevertheless, it has not become so widespread that when one uses the word "probiotic" others assume you are referring to soils and/or fertilizers.

Furthermore, Applicant has sought to claim his rights to the mark and to put the world on notice of said rights with the appropriate TM and/or ® marks (due to the California registration) on all labeling since he began its use. The word alone is never used to describe soil and/or fertilizers. Rather it is used to identify Applicant's particular brand of soils and fertilizers.

3.5 Failure to show that the Purchasing Public regards Applicant's mark not as a merely descriptive or generic term for the identified goods, but rather as an indicator of origin.

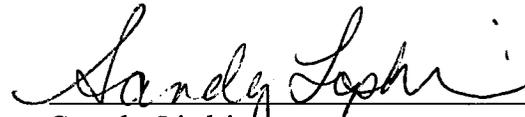
Exhibit C provides a statement from an expert in the industry indicating that Applicant has indeed become known as the originator of the goods.

4.0 Conclusion.

Applicant asserts that the mark is neither generic nor descriptive in that the commonly understood definition of the word does not apply to additives to soils and fertilizers. Hence, because the definition of the word is not associated in any way with soils and fertilizers, it cannot be found to be descriptive of generic relative thereto. Furthermore, Applicant's continued use of the word with regard to soils and fertilizers has not genericized the word to the point that it has become a synonym with the goods and services. Additionally, Applicant has provided evidence that the relevant purchasing public associates the mark with Applicant's goods and that the general public as well as the sub-group of the purchasers of this class of goods has not genericized the word to define said goods.

For the foregoing reasons, the Applicant submits that the refusal by the Trademark Examining Attorney to register the Applicant's mark should be reversed.

Respectfully submitted,



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Exhibit A



Invoice# 92-1478
Dr. Earth Inc.
Attn: Milo Shammass

August 14th, 1992

Description: Creative/Art for Soil and Fertilizer design work for
Probiotic Logo design.

Total Cost: \$322.00

Thank You,

**Colortek, Inc.
1280 Research Blvd.
St. Louis, MO. 63132
Office# 314-991-9003
Fax# 314-991-9013**

Exhibit B

Probiotic

From Wikipedia, the free encyclopedia

Probiotics are live microorganisms thought to be beneficial to the host organism. According to the currently adopted definition by FAO/WHO, probiotics are: "Live microorganisms which when administered in adequate amounts confer a health benefit on the host".^[1] Lactic acid bacteria (LAB) and bifidobacteria are the most common types of microbes used as probiotics; but certain yeasts and bacilli may also be helpful. Probiotics are commonly consumed as part of fermented foods with specially added active live cultures; such as in yogurt, soy yogurt, or as dietary supplements.

Etymologically, the term appears to be a composite of the Latin preposition *pro* ("for") and the Greek adjective *βιωτικός* (biotic), the latter deriving from the noun *βίος* (bios, "life").^[2]

At the start of the 20th century, probiotics were thought to beneficially affect the host by improving its intestinal microbial balance, thus inhibiting pathogens and toxin producing bacteria.^[3] Today, specific health effects are being investigated and documented including alleviation of chronic intestinal inflammatory diseases,^[4] prevention and treatment of pathogen-induced diarrhea,^[5] urogenital infections,^[6] and atopic diseases.^[7]

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History

The original observation of the positive role played by certain bacteria was first introduced by Russian scientist and Nobel laureate Eli Metchnikoff, who in the beginning of the 20th century suggested that it would be possible to modify the gut flora and to replace harmful microbes with useful microbes.^[3] Metchnikoff, at that time a professor at the Pasteur Institute in Paris, produced the notion that the aging process results from the activity of putrefactive (proteolytic) microbes producing toxic substances in the large bowel. Proteolytic bacteria such as clostridia, which are part of the normal gut flora, produce toxic substances including phenols, indols and ammonia from the digestion of proteins. According to Metchnikoff these compounds were responsible for what he called "intestinal auto-intoxication", which caused the physical changes associated with old age.

It was at that time known that milk fermented with lactic-acid bacteria inhibits the growth of proteolytic bacteria because of the low pH produced by the fermentation of lactose. Metchnikoff had also observed that certain rural populations in Europe, for example in Bulgaria and the Russian steppes who lived largely on milk fermented by lactic-acid bacteria were exceptionally long lived. Based on these facts, Metchnikoff proposed that consumption of fermented milk would "seed" the intestine with harmless lactic-acid bacteria and decrease the intestinal pH and that this would suppress the growth of proteolytic bacteria. Metchnikoff himself introduced in his diet sour milk fermented with the bacteria he called "Bulgarian Bacillus" and found his health benefited. Friends in Paris soon followed his example and physicians began prescribing the sour milk diet for their patients.^[8]

Bifidobacteria were first isolated from a breast-fed infant by Henry Tissier who also worked at the Pasteur Institute. The isolated bacterium named *Bacillus bifidus communis*^[9] was later renamed to the genus *Bifidobacterium*. Tissier found that bifidobacteria are dominant in the gut flora of breast-fed babies and he observed clinical benefits from treating diarrhea in infants with bifidobacteria. The claimed effect was bifidobacterial displacement of proteolytic bacteria causing the disease.

During an outbreak of shigellosis in 1917, German professor Alfred Nissle isolated a strain of *Escherichia coli* from the feces of a soldier who was not affected by the disease.^[10] Methods of treating infectious diseases were needed at that time when antibiotics were not yet available, and Nissle used the *Escherichia coli* Nissle 1917 strain in acute gastrointestinal infectious salmonellosis and shigellosis.

In 1920, Rettger demonstrated that Metchnikoff's "Bulgarian Bacillus", later called *Lactobacillus delbrueckii subsp. bulgaricus*, could not live in the human intestine,^[11] and the fermented food phenomena petered out. Metchnikoff's theory was disputable (at this stage), and people doubted his theory of longevity.

After Metchnikoff's death in 1916, the centre of activity moved to the United States. It was reasoned that bacteria originating from the gut were more likely to produce the desired effect in the gut, and in 1935 certain strains of *Lactobacillus acidophilus* were found to be very active when implanted in the human digestive tract.^[12] Trials were carried out using this organism, and encouraging results were obtained especially in the relief of chronic constipation.

The term "probiotics" was first introduced in 1953 by Werner Kollath (see Hamilton-Miller et al. 2003). Contrasting antibiotics, probiotics were defined as microbially derived factors that stimulate the growth of other microorganisms. In 1989 Roy Fuller suggested a definition of probiotics which has been widely used: "A live microbial feed supplement which beneficially affects the host animal by improving its intestinal microbial balance".^[13] Fuller's definition emphasizes the requirement of viability for probiotics and introduces the aspect of a beneficial effect on the host.

In the following decades intestinal lactic acid bacterial species with alleged health beneficial properties have been introduced as probiotics, including *Lactobacillus rhamnosus*,

Lactobacillus casei, and *Lactobacillus johnsonii*.^[14]

Indications

Experiments into the benefits of probiotic therapies suggest a range of potentially beneficial medicinal uses for probiotics. For many of the potential benefits, research is limited and only preliminary results are available. It should be noted that the effects described are *not* general effects of probiotics. Recent research on the molecular biology and genomics of *Lactobacillus* has focused on the interaction with the immune system, anti-cancer potential, and potential as a biotherapeutic agent in cases of antibiotic-associated diarrhoea, travellers' diarrhoea, pediatric diarrhoea, inflammatory bowel disease and irritable bowel syndrome.^[15]

All effects can only be attributed to the individual strain(s) tested. Testing of a supplement does not indicate benefit from any other strain of the same species, and testing does not indicate benefit from the whole group of LAB (or other probiotics).^[16]

Diarrhea

Infectious

Some probiotics have been shown to be beneficial in preventing and treating various forms of gastroenteritis.^[17] They reduce both the duration of illness and the frequency of stools.^[18] Fermented milk products (such as yogurt) also reduce the duration of symptoms.^[19]

Antibiotic associated

Antibiotic-associated diarrhea (AAD) results from an imbalance in the colonic microbiota caused by antibiotic therapy. Microbiota alteration changes carbohydrate metabolism with decreased short-chain fatty acid absorption and an osmotic diarrhea as a result. Another consequence of antibiotic therapy leading to diarrhea is overgrowth of potentially pathogenic organisms such as *Clostridium difficile*. The Culturelle product contains the strain *Lactobacillus rhamnosus* LGG, which studies indicate may reduce the risk of antibiotic associated diarrhea, improve stool consistency during antibiotic therapy and enhance the immune response after vaccination^[20].

Probiotic treatment can reduce the incidence and severity of AAD as indicated in several meta-analyses.^{[21][22][23][24][25][26]} However, further documentation of these findings through randomized, double blind, placebo-controlled trials are warranted.

Efficacy of probiotic AAD prevention is dependent on the probiotic strain(s) used and on the dosage.^{[27][28]} Up to a 50% reduction of AAD occurrence has been found.^[26] No side-effects have been reported in any of these studies. Caution should, however, be exercised when administering probiotic supplements to immunocompromised individuals or patients who have a compromised intestinal barrier.^[citation needed]

Lactose intolerance

As lactic acid bacteria actively convert lactose into lactic acid, ingestion of certain active strains may help lactose intolerant individuals tolerate more lactose than they would have otherwise.^[29]

Colon cancer

In laboratory investigations, some strains of LAB (*Lactobacillus bulgaricus*) have demonstrated anti-mutagenic effects thought to be due to their ability to bind with heterocyclic amines, which are carcinogenic substances formed in cooked meat.^[30] Animal studies have demonstrated that some LAB can protect against colon cancer in rodents, though human data is limited and conflicting.^[31] Most human trials have found that the strains tested may exert anti-carcinogenic effects by decreasing the activity of an enzyme called β-glucuronidase^[31] (which can generate carcinogens in the digestive system). Lower rates of colon cancer among higher consumers of fermented dairy products have been observed in one population study.^[29]

Cholesterol

Animal studies have demonstrated the efficacy of a range of LAB to be able to lower serum cholesterol levels, presumably by breaking down bile in the gut, thus inhibiting its reabsorption (which enters the blood as cholesterol).^[29]

A meta-analysis that included five double blind trials examining the short term (2-8weeks) effects of probiotic yoghurt on serum cholesterol levels found an overall decrease of 8.5 mg/dL (0.22mmol/L) (~4% decrease) in total cholesterol concentration, and a decrease of 7.7 mg/dL (0.2mmol/L) (~5% decrease) in serum LDL concentration.^[32]

A slightly longer study evaluating the effect of probiotic yoghurt on twenty-nine subjects over six months found no statistically significant differences in total serum cholesterol or LDL values. However, the study did note a significant increase in serum HDL from 50 mg/dL (1.28mmol/L) to 62 mg/dL (1.6mmol/L) following treatment. This corresponds to an improvement of LDL/HDL ratio from 3.24 to 2.48, with a 95% confidence interval of ± 0.33.^[33]

Studies specifically on hyper-lipidemic subjects are still needed.

Blood pressure

Several small clinical trials have indicated that consumption of milk fermented with various strains of LAB may result in modest reductions in blood pressure. It is thought that this is due to the ACE inhibitor-like peptides produced during fermentation.^[29]

Immune function and infections

LAB are thought to have several presumably beneficial effects on immune function. They may protect against pathogens by means of competitive inhibition (i.e., by competing for growth) and there is evidence to suggest that they may improve immune function by increasing the number of IgA-producing plasma cells, increasing or improving phagocytosis as well as increasing the proportion of T lymphocytes and Natural Killer cells.^{[34][35]} Clinical trials have demonstrated that probiotics may decrease the incidence of respiratory tract infections^[36] and dental caries in children.^[37] LAB foods and supplements have been shown to aid in the treatment and prevention of acute diarrhea, and in decreasing the severity and duration of rotavirus infections in children and travelers' diarrhea in adults.^{[34][35]}

A 2010 study suggested that the anecdotal benefits of probiotic therapies as beneficial for preventing secondary infections, a common complication of antibiotic therapy, may be because keeping the immune system primed by eating foods enhanced with "good" bacteria may help counteract the negative effects of sickness and antibiotics. It was thought that antibiotics may

turn the immune system "off" while probiotics turns it back on "idle", and more able to quickly react to new infections.^[38]

Helicobacter pylori

LAB are also thought to aid in the treatment of *Helicobacter pylori* infections (which cause peptic ulcers) in adults when used in combination with standard medical treatments. However more studies are required into this area.^[39]

Inflammation

LAB and supplements have been found to modulate inflammatory and hypersensitivity responses, an observation thought to be at least in part due to the regulation of cytokine function.^[34] Clinical studies suggest that they can prevent reoccurrences of inflammatory bowel disease in adults,^[34] as well as improve milk allergies.^[40] They are not effective for treating eczema, a persistent skin inflammation.^[41] How probiotics counteract immune system overactivity remains unclear, but a potential mechanism is desensitization of T lymphocytes, an important component of the immune system, towards pro-inflammatory stimuli.^[42]

Mineral absorption

It is hypothesized that probiotic lactobacilli may help correct malabsorption of trace minerals, found particularly in those with diets high in phytate content from whole grains, nuts, and legumes.^[43]

Bacterial growth under stress

In a study done to see the effects of stress on intestinal flora, rats that were fed probiotics had little occurrence of harmful bacteria latched onto their intestines compared to rats that were fed sterile water.^[44]

Irritable bowel syndrome and colitis

B. infantis 35624, sold as Align, was found to improve some symptoms of irritable bowel syndrome in women in a recent study.^[45] Another probiotic bacterium, *Lactobacillus plantarum* 299v, was also found to be effective in reducing IBS symptoms.^[46] Additionally, a probiotic formulation, VSL#3, was found to be safe in treating ulcerative colitis, though efficacy in the study was uncertain.^[47] *Bifidobacterium animalis* DN-173 010 may help.^[48] For maintenance of remission of ulcerative colitis, Mutaflor (*E.coli* Nissle 1917) there are 3 controlled, randomized, double blind clinical studies which have proven equivalence of Mutaflor and mesalazine (5-ASAs).^[49]

Other

A study in 2004 testing the immune system of students given either milk or Actimel over a 6 week exam period (3 weeks of studying, 3 weeks of exams) tested 19 different biomarkers. Of these 19 biomarkers only 2 were shown to be different between the two groups, increased production of lymphocytes and increased production of CD56 cells. The tests were not blind and show that certain probiotic strains may have no overall effect on the immune system or on its ability.^[50]

A 2007 study at University College Cork in Ireland showed that a diet including milk fermented with *Lactobacillus* bacteria prevented *Salmonella* infection in pigs.^[51]

A 2007 clinical study at Imperial College London showed that preventive consumption of a commercially available probiotic drink containing *L casei* DN-114001, *L bulgaricus*, and *S thermophilus* can reduce the incidence of antibiotic-associated diarrhea and *C difficile*-associated diarrhea.^[52]

The efficacy and safety of a daily dose of *Lactobacillus acidophilus* CL1285 in the prevention of AAD was demonstrated by Montreal's Maisonneuve-Rosemont Hospital, in a clinical study of hospitalized patients.^[53]

Current research is focusing on the molecular biology and genomics of *Lactobacillus* and bifidobacteria. The application of modern whole genome approaches is providing insights into bifidobacterial evolution, while also revealing genetic functions that explain their presence in the particular ecological environment of the gastrointestinal tract.^{[54][55]}

Probiotics are used in industry to improve yields of pork and chicken production.^[56]

Side effects

In some situations, such as where the person consuming probiotics is critically ill, probiotics could be harmful. In a therapeutic clinical trial conducted by the Dutch Pancreatitis Study Group, the consumption of a mixture of six probiotic bacteria increased the death rate of patients with predicted severe acute pancreatitis.^[57]

In a clinical trial conducted at the University of Western Australia, aimed at showing the effectiveness of probiotics in reducing childhood allergies, Dr Susan Prescott and her colleagues gave 178 children either a probiotic or a placebo for the first six months of their life. Those given the good bacteria were more likely to develop a sensitivity to allergens.^[58]

Some hospitals have reported treating lactobacillus septicaemia, which is a potentially fatal disease caused by the consumption of probiotics by people with lowered immune systems or who are already very ill.^{[58][59]}

There is no published evidence that probiotic supplements are able to replace the body's natural flora when these have been killed off; indeed bacterial levels in feces disappear within days when supplementation ceases.^[60]

Probiotics taken orally can be destroyed by the acidic conditions of the stomach. A number of micro-encapsulation techniques are being developed to address this problem.^[61]

Recent studies indicate that probiotic products such as yogurts could be a cause for obesity trends.^[62] However, this is contested as the link to obesity and other health related issue with yogurt may link to its dairy attributes.^{[63][64]}

Some experts are skeptical on the efficacy of many strains and believe not all subjects will benefit from the use of probiotics. A criticism of probiotic supplements is the cost and value of probiotics products.^[65]

Strains

Live probiotic cultures are available in fermented dairy products and probiotic fortified foods. However, tablets, capsules, powders and sachets containing the bacteria in freeze dried form are also available.

Probiotic Research and Producer Information ^[66]			
Strain	Brandname	Producer	Potential effect in humans
<i>Bacillus coagulans</i> GBI-30, 6086	GanedenBC ³⁰	Ganeden Biotech	Improves abdominal pain and bloating in IBS patients. ^[67] Increases immune response to viral challenge. ^[68]
<i>Bifidobacterium LAFTI B94</i> <i>Bifidobacterium</i> sp	LAFTI B94	Institut Rosell-Lallemand	Protects against <i>Salmonella typhimurium</i> in mice. Uses prebiotics for improved colonization. Facilitates apoptotic response when used in combination with resistant starch in a colon cancer model. Reduces inflammation and incidence of diarrhea in an IBS model. Reduces allergic responses in an allergy model. Reduces the severity of <i>H.pylori</i> infection of the stomach mucosa. Inhibits pathogenic bacteria, including <i>H.pylori</i> , <i>monocytogenes</i> , <i>E. coli</i> , and <i>salmonella typhimurium</i> . Survives in the conditions of the gastro-intestinal tract. Adheres to human intestinal cells. Synthesizes folate from yogurts. ^[citation needed]
<i>Lactobacillus acidophilus LAFTI L10</i> <i>Lactobacillus acidophilus</i>	LAFTI L10	Institut Rosell-Lallemand	Enhances clearance of <i>Candida albicans</i> by induction of an immune response. Reduces allergic responses in an allergy model. Protects against <i>Listeria monocytogenes</i> in the gastro-intestinal tract of mice. Reduces incidence of tumor formation and the size of intestinal tumors in rats. Uses prebiotics for improved colonization. Reduces inflammation in an IBS model. Inhibits pathogenic bacteria, including <i>H. pylori</i> , <i>monocytogenes</i> , <i>E. colim</i> , and <i>Salmonella typhimurium</i> . Superior survival in the conditions of the gastro-intestinal tract compared to other probiotics. Adheres to human intestinal cells. Produces anti-microbial substances like H2O2. ^[citation needed]
<i>Lactobacillus casei LAFTI L26</i> <i>Lactobacillus casei</i>	LAFTI L26	Institut Rosell-Lallemand	Protects against <i>Salmonella typhimurium</i> in mice. Uses prebiotics for improved colonization. Reduces inflammation in an IBS model. Reduces allergic responses in an allergy model. Reduces the severity of <i>H.pylori</i> infection of the stomach mucosa. Inhibits pathogenic bacteria, including <i>H. pylori</i> , <i>monocytogene</i> , <i>E. coli</i> , and <i>Salmonella typhimurium</i> . Survives in the conditions of the gastro-intestinal tract. Adheres to human intestinal cells. ^[citation needed]
<i>Bifidobacterium animalis</i> subsp. <i>lactis</i> BB-12	Probio-Tec <i>Bifidobacterium</i> BB-12	Chr. Hansen	Human studies have shown that BB-12® alone or in combinations has a beneficial effect within gastrointestinal health and immune health. ^[69] ^[citation needed]
<i>Bifidobacterium breve</i> Yakult	Bifiene	Yakult	^[citation needed]
<i>Bifidobacterium infantis</i> 35624	Align	Procter & Gamble	Showed significant improvement for abdominal pain/discomfort, bloating/distention, and bowel movement difficulty. ^[70]
<i>Bifidobacterium animalis</i> subsp. <i>lactis</i> HN019 (DR10)	Howaru Bifido	Danisco	^[citation needed]
<i>Bifidobacterium longum</i> BB536		Morinaga Milk Industry	^[citation needed]
<i>Escherichia coli</i> M-17	ProBactrix	BioBalance	^[citation needed]
<i>Escherichia coli</i> Nissle 1917	Mutaflor	Ardeypharm (http://www.ardeypharm.de/en/)	^[citation needed]
<i>Lactobacillus acidophilus</i> DDS-1		Nebraska Cultures ^[71]	^[citation needed]
<i>Lactobacillus acidophilus</i> LA-5		Chr. Hansen	Human studies have shown that LA-5® has a beneficial effect within gastrointestinal health. The LA-5 strain and its clinical documentation (http://www.chr-hansen.com/campaign_sites/probiotics_for_human_health/our_probiotic_products/strains/la_5r.html) ^[citation needed]
<i>Lactobacillus acidophilus</i> NCFM		Danisco	Shown to reduce the side effects of antibiotic therapy. ^[72]
<i>Lactobacillus casei</i> DN114-001 (<i>Lactobacillus casei</i> Immunitas(s)/Defensis)	Actime1/DanActive	Danone	^[citation needed]
<i>Lactobacillus casei</i> 431		Chr. Hansen	Human studies have shown that <i>L. casei</i> 431® alone or in combinations has a beneficial effect within gastrointestinal health Clinical documentation on <i>L. casei</i> 431 (http://www.chr-hansen.com/campaign_sites/probiotics_for_human_health/our_probiotic_products/strains/l_casei_431r.html) ^[citation needed]
<i>Lactobacillus casei</i> F19	Cultura	Arla Foods	^[citation needed]
<i>Lactobacillus casei</i> Shirota	Yakult	Yakult	^[citation needed]
<i>Lactobacillus paracasei</i> St11 (or NCC2461) ^[73]	<i>Lactobacillus fortis</i>	Nestlé	^[citation needed]
<i>Lactobacillus</i>			

<i>johnsonii</i> La1 (= <i>Lactobacillus</i> LC1, <i>Lactobacillus johnsonii</i> NCC533)		Nestlé	Reduces incidences of <i>H. pylori</i> -caused gastritis and reduces inflammation ^[74]
<i>Lactococcus lactis</i> L1A		Normmejerier	Immune stimulation, improves digestive health, reduces antibiotic-associated diarrhoea ^[75]
<i>Lactobacillus plantarum</i> 299v	GoodBelly / ProViva/ TuZen/ Bion Transit / ProbiMage	Probi	Shown to improve symptoms of IBS. ^[76]
<i>Lactobacillus reuteri</i> ATCC 55730 (<i>Lactobacillus reuteri</i> SD2112)		BioGaia Biologics	Diarrhea prevention and mitigation in children, ^{[77][78]} eradication of <i>H. pylori</i> infection, ^[79] amelioration of gingivitis, ^[80] general illness prevention in children ^[81] and adults. ^[82]
<i>Lactobacillus rhamnosus</i> ATCC 53013 (Also strain number GG, discovered by Gorbach & Goldin)	LGG, Gefilus, Vifit and others	Valio	<i>[citation needed]</i>
<i>Lactobacillus rhamnosus</i> LB21	Verum	Normmejerier	Immune stimulation, improves digestive health, reduces antibiotic-associated diarrhoea ^[75]
<i>Saccharomyces boulardii</i>	DiarSafe and others	Wren Laboratories and others	Protects against antibiotic-associated diarrhoea and infections of <i>Clostridium difficile</i> and other clostridial species; helps treat acute diarrhoea in adults & children. ^{[83][84][85]}
tested as mixture: <i>Lactobacillus rhamnosus</i> GR-1 & <i>Lactobacillus reuteri</i> RC-14	Bion Flore Intime Jarrow Fem-Dophilus	Chr. Hansen	Oral ingestion results in vaginal colonisation and prevention of vaginitis. Clinical studies on RC-14 and GR (http://www.chr-hansen.com/campaign_sites/probiotics_for_human_health/our_probiotic_products/strains/rc_14r_gr_1r.h) ^[86]
tested as mixture: <i>Lactobacillus acidophilus</i> NCFM & <i>Bifidobacterium bifidum</i> BB-12	Florajen3	American Lifeline, Inc	Reduction of <i>C. difficile</i> -associated disease (CDAD)[1] (http://www.florajen.com/pdfs/CdifClinicalStudy.pdf) .
tested as mixture: <i>Lactobacillus acidophilus</i> CL1285 & <i>Lactobacillus casei</i> LBC80R	Bio-K+ CL1285	Bio-K+ International	Improves digestive health. Prevents Antibiotic Associated Diarrhea (AAD) and <i>Clostridium difficile</i> (<i>C. difficile</i>). ^[53] In vitro inhibition of <i>Listeria monocytogenes</i> and <i>L. innocua</i> , <i>Escherichia coli</i> , <i>Staphylococcus aureus</i> , <i>Enterococcus faecalis</i> and <i>Enterococcus faecium</i> . ^[87] Reduction of symptoms of lactose intolerance and immune stimulation. ^[88]
<i>Lactobacillus plantarum</i> HEAL 9 & <i>Lactobacillus paracasei</i> 87002	Bravo Friscus/ ProbiFrisk	Probi	Reduces the risk of acquiring common cold infections. ^[89]
<i>Lactobacillus helveticus</i> R0052 & <i>Lactobacillus rhamnosus</i> R0011	A'Biotica and others	Institut Rosell	<i>[citation needed]</i>
<i>Lactobacillus casei</i> var. <i>rhamnosus</i> MG001 & <i>Lactobacillus acidophilus</i> MG002 & <i>Lactobacillus plantarum</i> MG003 & <i>Enterococcus faecium</i> MG004	Symprove Probiotic	Symprove Ltd.	<i>[citation needed]</i>

Some additional forms of yogurt bacteria include:

- *Lactobacillus bulgaricus*
- *Streptococcus thermophilus*
- *Lactobacillus bifidus* - became new genus *Bifidobacterium*

Some fermented products containing similar lactic acid bacteria include:

- Pickled vegetables^{[90][91][92]}
- Fermented bean paste such as tempeh,^[93] miso and doenjang

- Kefir^[citation needed]
- Buttermilk or Karmemelk
- Kimchi^{[91][94]}
- Pao cai^[citation needed]
- Sauerkraut^[95]
- Soy sauce^[96]
- Zha cai^[citation needed]

Multi-probiotic

Research is emerging on the potential health benefits of multiple probiotic strains as a health supplement as opposed to a single strain.^{[97][98]} The human gut is home to some 400-500 types of microbes. It is thought that this diverse environment may benefit from multiple probiotic strains; different strains populate different areas of the digestive tract, and studies are beginning to link different probiotic strains to specific health benefits.

Incomplete list of supplement products that contain more than one probiotic strain.

Company	Product	Probiotic Strains	Strain Qty
EMD Canada Inc.	Multibionta	<i>Lactobacillus gasseri PA16/8</i> , <i>Bifidobacterium bifidum MF20/5</i> , <i>Bifidobacterium longum SP07/3</i>	3
OptiBac Probiotics	For daily wellbeing	<i>Bifidobacterium longum Rosell-175</i> , <i>Lactococcus lactis Rosell-1058</i> , <i>Bifidobacterium breve Rosell-70</i> , <i>Lactobacillus rhamnosus Rosell-11</i> , <i>Lactobacillus acidophilus Rosell-52</i> , <i>Bifidobacterium bifidum rosell-71</i>	6
Symprove Ltd. UK	Symprove Probiotic	<i>Lactobacillus casei var. rhamnosus MG001</i> , <i>Lactobacillus acidophilus MG002</i> , <i>Lactobacillus plantarum MG003</i> , <i>Enterococcus faecium MG004</i>	4

See also

- Prebiotic (nutrition)
- Synbiotics
- Fecal bacteriotherapy

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External links

- International Scientific Association for Probiotics and Prebiotics (http://www.isapp.net)
- Probiotics: Considerations for Human Health (http://www.nationaldairycouncil.org/NationalDairyCouncil/HealthDigest/dcd76-1Page2.htm)
- Getting To Know "Friendly Bacteria" (http://nccam.nih.gov/news/newsletter/2006_summer/bacteria.htm)
- Probiotics: Friendly Bacteria With a Host of Benefits (http://www.dairycouncilofca.org/PDFs/probiotics.pdf)
- International Food Information Council (http://ific.org/publications/factsheets/preprobioticsf.cfm)
- Information On Probiotics (http://www.probiotics-lovethatbug.com)
- National Yogurt Association (http://aboutyogurt.com/lacYogurt/Probiotics.pdf)
- WhyFiles.org (http://whyfiles.org/302gut_flora/index.php?g=1.txt) : Web magazine feature about probiotics
- Probiotic may ease fatigue syndrome anxiety (http://www.ctv.ca/servlet/ArticleNews/story/CTVNews/20090406/probiotics_anxiety_090406/20090406?hub=Health)

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Categories: Bacteriology | Digestive system | Probiotics | Microbiology

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Exhibit C



Affidavit Affecting Dr. Earth ®ProBiotic™ Brand

This letters sworn testimonies do herby make the following statements of fact and affirm:

- 1) I, Dr. Mike Amaranthus, President of Mycorrhizal Applications, Inc. The leader in mycorrhizal soil and plant inoculants across America, do swear that until Dr. Earth brought the [DESCRIPTIVE] word "probiotic" to the lawn & garden industry, it was never used, nor had I heard it used other than for animal feed or human supplements.
- 2) I have been in the lawn & Garden industry for 30 years and I completely credit Milo Lou Shammass for popularizing this term in association with fertilizers and soils in the early 1990's. Because of the popularity of Dr. Earth branded products and its inclusion of the "probiotic" brand, organic fertilizers and soils have become mainstream and common place, this is specifically due to the sweat equity that Mr. Milo Shammass invested, over 15 years of "product Knowledge" training seminars, radio, television interviews, traveling across America teaching gardeners at the nursery level to sell probiotic fertilizers and soils to return "life back to dead and lifeless soil".
- 3) Mr. Shammass's hard work has paved the way for many other companies to start using beneficial soil microbes and mycorrhizae in their soil and fertilizer blends, and his work has forever changed the lawn and garden industry for the better. I commend Mr. Milo Shammass's innovative vision that has made probiotic a common word now in the lawn & garden industry.

Sincerely,
/s/ Mike Amaranthus
Mike Amaranthus PhD.
President
Mycorrhizal Application, Inc.
www.mycorrhizalapplications.com

Exhibit D

Field Trial and Efficacy Report

Performance of Dr. Earth® ProBiotic™ fertilizer in soil applications.

Prepared by: Milo Lou Shammass
Dr. Earth Company

ProBiotic™ fertilizer Effects on Tomatoes Color and Yield
April 1989-September 1989
Research funded by Dr. Earth Company
Research carried out by Milo Shammass, Founder & Formulator, Dr. Earth.

Introduction:

This trial examined the efficacy of Dr. Earth® ProBiotic™ fertilizer infused with a combination of Dr. Earth Planting Mix and Dr. Earth Potting Soil, on yield and color penetration of tomatoes. The digestion and break-down of organic compounds that has been studied is proposed to increase the plant nutrient release allowing for increased microbial activity in turn increasing the overall plant vigor as evident by the yield and color penetration. This study showed an 11.4% increase in yield by weight of ripe fruit and a 10.2% increase in color penetration when comparing treatment 3 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil) and ProBiotic™ microbes and Mycorrhizae to the bed prepared with treatment 2 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil).

Materials and Methods:

This trial was held in Los Angeles California in a sandy loam soil with a pH range of 7.2-7.5. The land had been fallow for the previous 3 years and was rated 7% for soil organic matter. Nine raised beds, 6 ft x 9 ft x 1 ft each, were built with a 3 foot path between each bed. Each bed received 12 inches of soil mixture above the native ground, a volume of 54 cubic feet. Each of the three treatments were carried out in three randomly selected beds labeled a, b and c. The three treatments were as follows: treatment 1) control beds consisting of native un-amended soil, treatment 2) 50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil, and treatment 3) 50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil with 3,500,000 viable microbial Propagules per cubic centimeter [described] Dr. Earth Probiotic™. Six *Big Boy* variety tomato starts in good condition and with an average size of 20cm x 10 cm were randomly selected for each raised bed. Tomatoes were purchased on April 21, 1989. Beds were treated and planted on April 22, 1989. All plots were irrigated using a timer-controlled, pressure-regulated, drip-

irrigation emitter system. The system delivered equal amounts of water at identical times to all plots. Irrigation was periodically increased equally for all plots as the plants increased in size. No additional pesticides were applied.

Tomatoes were harvested once per week for 6 weeks starting August 17th and ending September 22nd. The tomatoes were weighed fresh. Once per week after planting, pictures of each plot were taken and the foliage color penetration was analyzed on a computer.

Results:

Table 1 shows the yield of each bed by treatment and time:

Table 1: Yield Ripe Tomatoes

Date	Trial 1a	Trial 1b	Trial 1c	Trial 2a	Trial 2b	Trial 2c	Trial 3a	Trial 3b	Trial 3c
17-Aug	38.20	33.30	37.10	65.50	63.50	67.30	68.20	72.00	70.20
24-Aug	22.40	22.90	31.30	28.50	27.50	32.50	28.30	32.40	32.00
31-Aug	66.30	69.70	72.00	93.70	91.80	96.30	92.00	101.10	99.80
8-Sep	42.50	49.50	40.20	74.10	71.40	76.10	82.20	88.90	87.30
15-Sep	31.10	32.10	35.30	53.90	51.90	55.10	67.00	62.30	69.90
22-Sep	13.20	15.60	17.40	21.90	21.90	22.40	35.50	26.20	31.10
Average	35.62	37.18	38.88	56.27	54.67	58.28	62.20	63.82	65.05
Average Weekly Total			37.23			56.41			63.69
Average Seasonal Total			223.37			338.43			382.13
Total Yield	213.70	223.10	233.30	337.60	328.00	349.70	373.20	382.90	390.30

When comparing the average weekly yield of treatment 3 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil with ProBiotic™) versus treatment 1 (the control) there is a P value of 0.0025. This shows that there is a significant difference between the treatments to the 99.75% confidence level.

When comparing the average weekly yield of treatment 3, (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil with ProBiotic™) versus treatment 2 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil) there is a P value of 0.2. This shows that there is a significant difference between the treatments to the 80% confidence level.

When comparing the average weekly yield of treatment 2 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil) with treatment 1 (the control) there is a P value of 0.01. This shows that there is a significant difference between the treatments to the 99% confidence level.

Table 2 shows the pixel penetration levels of each bed by treatment over time:

Table 2: Pixel Penetration

Date	Trial 1a	Trial 1b	Trial 1c	Trial 2a	Trial 2b	Trial 2c	Trial 3a	Trial 3b	Trial 3c
22-Apr	4.3	4.4	4.3	4.2	4.3	4.2	4.3	4.3	4.3
30-Apr	4.3	4.4	4.4	4.8	4.6	4.8	5.7	5.5	5.3
7-May	4.3	4.7	4.5	6.8	6.2	6.1	7.3	7.5	6.9
14-May	5	5.1	4.9	7	6.8	6.7	7.7	7.7	7.5
21-May	5.3	5.4	5.4	7.5	7.2	7.1	8.3	8.2	7.9
28-May	6.3	6.2	6.1	7.9	7.1	7	8	8.3	7.8
5-Jun	5.7	5.9	5.8	7.4	7.1	7	8	8.1	7.8
12-Jun	6.7	6.6	7	7.2	7	6.9	8	7.9	7.7
19-Jun	7	6.9	7.1	7.4	7.1	7	8	8	7.8
26-Jun	6.7	6.8	6.7	7.1	6.8	6.7	7.7	7.8	7.5
5-Jul	6.3	6.4	6.3	7.5	7.4	7.3	8.3	8.2	8.1
12-Jul	6.3	6.2	6.1	8	8	7.6	8.7	8.6	8.4
19-Jul	5.7	5.5	5.9	7.5	7	6.9	8	8.2	7.7
26-Jul	5.7	5.8	5.7	7.3	7.1	7.1	8	8.1	7.8
3-Aug	6.3	6.2	5.9	7.2	6.8	6.7	7.7	7.9	7.5
10-Aug	5.3	5.4	5.4	7	6.8	6.7	7.7	7.7	7.5
17-Aug	5.7	5.5	5.4	6.9	6.1	6	7	7.5	6.8
24-Aug	5.3	5.2	5.2	6.5	6.1	6	7	7.2	6.8
31-Aug	5.3	5.2	5.4	6.3	5.6	5.5	6.3	6.8	6.3
8-Sep	6	5.6	5.6	6.3	6.1	6	7	7	6.8
15-Sep	5.3	5.2	5.4	6.3	5.8	5.7	6.7	6.8	6.5
22-Sep	5.3	5.1	5.1	5.9	5.8	5.7	6.5	6.6	6.5
Average	5.64	5.62	5.62	6.82	6.49	6.40	7.36	7.45	7.15
Average abc	5.63			6.57			7.32		

When comparing the color penetration of treatment 3 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil with ProBiotic™) versus treatment 1 (the control) there is a P value of less than 0.0005. This shows that there is a significant difference between the treatments greater than 99.99% confidence level.

When comparing the color penetration of treatment 3 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil with ProBiotic™) versus treatment 2 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil) there is a P value of less than 0.0005. This shows that there is a significant difference between the treatments greater than 99.99% confidence level.

When comparing the color penetration of treatment 2 (50% Dr. Earth Planting Mix and 50% Dr. Earth Potting Soil) versus treatment 1 (the control) there is a P value of less than 0.0005. This shows that there is a significant difference between the treatments greater than 99.99% confidence level.

Conclusions:

The above data shows that there is a significant increase in intensity of color penetration of the tomato plants at any reasonable confidence interval with the addition of Dr. Earth ProBiotic™. Though there is an increased yield from treatments 2 to 3 the evidence is not as strong as in the color analysis. However, there is a significant increase in yield between treatments 1 and 3.

Further research is recommended to test the moisture of each soil sample at regular intervals to show if the increase in performance is due to an increased water binding capacity from the addition of the Glomalin released by ProBiotic™. A test of the activity rate of the microbial populations in each of the trial beds could further pinpoint the reasons for the increase in yield and vigor.

Exhibit E

DR. EARTH
Pro-Biotic™ on the Pathogen Patrol!
August 1996

Fungus can sometimes be our best friend, or it could be our worst enemy. Beneficial mycorrhizal fungi are one of our best friends for the health and success of our plants and their ability to succeed in our garden under general or unfavorable growing conditions but conversely harmful pathogenic fungus such as pythium and rhizoctonia (damping-off), thielaniopsis (black root rot), and several other root rot and wilt organisms such as fusarium and phytophthora are one of our worst enemies in the garden. Our healthy plants lay victim to the devastating effects of pathogenic fungus and their ability to destroy an entire garden in a short period of time. The conventional approach relies on fungicide drenches and soil fumigants. The natural control of harmful fungus has been occurring for millions of years through a process known as "general suppression". The disease suppressive characteristics of Pro-Biotic™ are due to the release of antibiotic compounds such as phenols and penicillin and to a proliferation of bacterial and fungal micro flora that suppress pathogens through antagonism, competition, predation and induced resistance. Dr. Earth's Pro-Biotic™ is on the pathogen patrol every day.

General suppression is the natural way to control pathogens. If the soil is healthy, it will be full of beneficial bacteria such as *Bacillus subtilis*, *Bacillus megaterium*, *Bacillus cereus*, *Lactobacillus acidophilus* and other beneficial bacteria. Pathogenic fungus enjoy damp, wet conditions where they do not have to compete with other organisms, it is rare for pathogens to take over a healthy soil, which consists of a balanced mix of organic components that are home to an abundance of beneficial microbes. Dr. Earth Pro-Biotic™ fertilizer consists of "7 Champion Strains" of beneficial microbes plus 8 species of Ecto and Endo-Mycorrhizae, which contribute greatly to suppressing fungal pathogens naturally without any side effects to plants, people or pets.

Healthy soils that have been properly inoculated with Dr. Earth Pro-Biotic™ have the ability to fight off disease causing pathogens, which are severely destructive to growing plants. Productive soil increases the chances of plant survival so pathogens will not multiply in great numbers. ProBiotic™ fills up the available spaces in the soil so that pathogens cannot become established and destroy healthy plants. For example, think of a parking lot at the supermarket, if every parking space has been occupied there is simply no space to park your car, same exact thing happens in the soil, if all of the available space has been occupied by ProBiotic™ there is no space available for destructive pathogens to become established and do their damage to plants. The idea is to create an environment that is rich with ProBiotic™ fertilizer so that fungal diseases do not have a chance to become established or park in that space! Pro-Biotic™ is the natural way to kill and control fungal pathogens keeping your soil and plants healthy throughout the year naturally.

Milo Lou Shammass
President
Dr. Earth, Inc.

Exhibit F

The Importance of Dr. Earth ProBiotic Fertilizer.
July 23, 1992

The soil is alive! Invisible to the naked eye are the great digesters of the earth, constantly breaking down organic material into a more usable form that plant roots can identify, absorb and ultimately incorporate for new growth. Below our feet lie the wonders of a variety of living organisms that are hard at work converting complex organic compounds such as, tannins, lignin's, proteins, carbohydrates, cellulose, pectin, etc. into a usable form plants can incorporate for growth. ProBiotic helps to stabilize the soil by physically binding soil particles together; they release a by-product called glomalin that acts as a "glue" to help bind mineral particles and organic material together, which contributes greatly to soil aggregation. All of this happening in a healthy, productive soil.

Healthy soil should contain no less than 10,000,000 bacteria per gram; the presence of ProBiotic ensures that nutrients are made available to plants at a steady rate. As the plants are actively growing and require more nutrients, so does ProBiotic in the soil. As the weather warms both the plant and ProBiotic respond at a similar rate. This is a self regulating cycle that has occurred for millions of years. ProBiotic becomes more active in warm weather in the soil, digesting organic materials and converting them into a usable form plants can absorb. As the weather cools and plants require less nutrition, so does ProBiotic, which means fewer nutrients are being released in the soil, the soil can build food reserves this way.

When we feed our plants and not our soil, we lose all the benefits that ProBiotic contributes. When we say feed the soil it means feed the microbes in the soil because it is the microbes that make nutrients available for the plants. The way you feed microbes is through the addition of organic material, if you feed with a synthetic chemical fertilizer you are feeding the plant, not the soil, or the microbes. By adding petrochemical synthetic fertilizer we drive up the salt index in the soil and change the pH, which can have adverse effects on plants. More importantly chemical fertilizers only feed for a short period of time; organic fertilizers have a continual feeding because ProBiotic cannot digest all of the organic fertilizer overnight. With chemical fertilizers we also do not get the benefits of probiotic contribution to soil aggregation, which leads to good tilth, Water retention, the rate at which water penetrates the soil, the amount of oxygen in the soil, reduction of runoff, all can be achieved with the addition of organic material to the soil.

The importance of the ProBiotic fertilizer is immeasurable, it is essential to the health of all productive soils. To elevate the microbial colonies in your garden soil use Dr. Earth Probiotic fertilizers and soils, they contain a broad-spectrum soil & seed inoculant already mixed into the products. Two things will happen when you use ProBiotic. First the organic fertilizer and soil will become the food source for ProBiotic; this will provide almost immediate nutrition for your plants, which means fast results. Most importantly, Dr. Earth ProBiotic, unlike most organic fertilizers and soils, actually contains various species of beneficial microbes in the product. This ensures that your soil will contain the proper number of microbes to truly benefit your plants.

Increasing biological activity and building up existing bacterial populations in the soil make your plants and garden resistant to diseases, frost and insects while adding maximum growth and health potential. Remember, your

soil is alive - DO NOT TREAT IT LIKE DIRT! Learn to work with and nurture the natural bio-system of your soil.

Milo Lou Shammass
President
Dr. Earth Company

Exhibit G

DR. EARTH organic 7

ALL PURPOSE FERTILIZER

DR. EARTH®

FOR YOUR:

- VEGETABLES
- ALL FLOWERS
- BEDDING PLANTS
- POTTED PLANTS
- ALL TREES
- SHRUBS
- ANNUALS
- PERENNIALS

• PETALS PET SAFE

CONTAINS

PRO-BIOTIC
BENEFICIAL
SOIL MICROBES

4 - 4 - 4

FEEDS 60 SQUARE FEET
80 ONE-GALLON PLANTS
OR 16 FIVE-GALLON
PLANTS

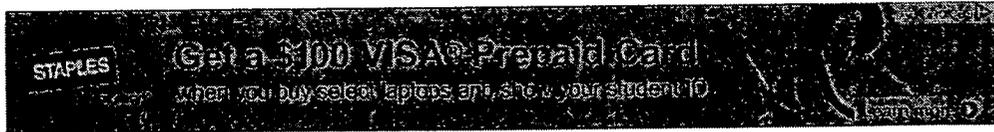
CONTAINS ESTABLISHED
MYCORRHIZAE

PREMIUM

organic 7

ALL PURPOSE
FERTILIZER

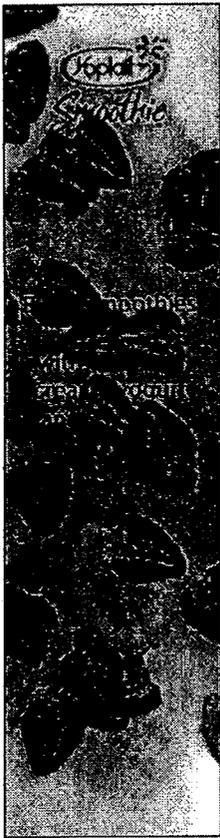
Exhibit H



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probiotic

probiotic



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www.AlignGI.com/Yogurt

pro·bi·ot·ic *noun* \prō-bī-ō-tīk, -bē-ō-ē\

Definition of PROBIOTIC

Like

: a preparation (as a dietary supplement) containing live bacteria (as lactobacilli) that is taken orally to restore beneficial bacteria to the body; *also* : a bacterium of such a preparation

— *probiotic adjective*

Origin of PROBIOTIC

²*pro-* + *-biotic* (as in *antibiotic*)

First Known Use: 1951

Browse

Next Word in the Dictionary: *probit*
Previous Word in the Dictionary: *proberlite*
All Words Near: *probiotic*

“Seen & Heard” BETA

What made you want to look up *probiotic*? Please tell us where you read or heard it (including the quote, if possible).

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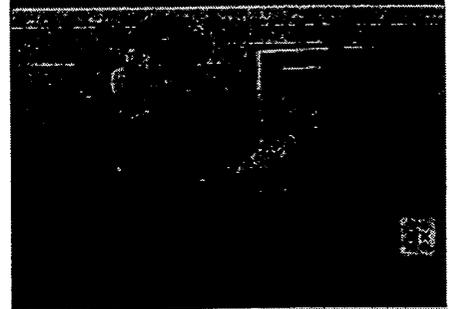
Anita Goodwin · Edward H. White High School
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