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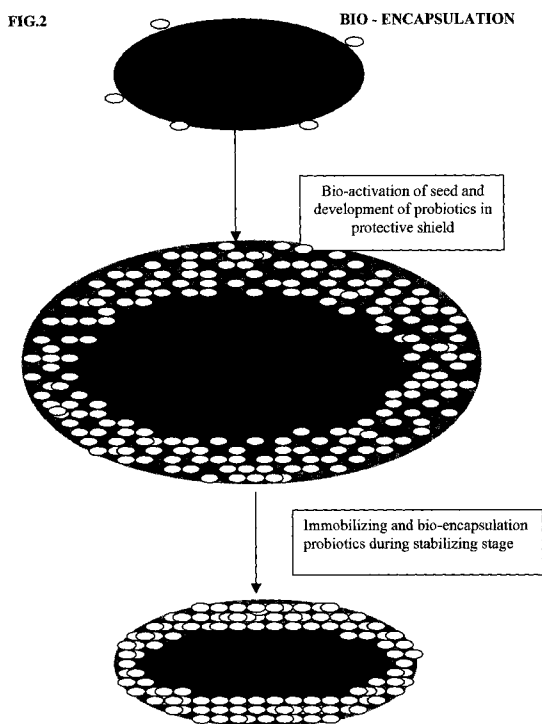


FIG.2 Process of enrichment and stabilizing probiotics in synbiotic composition based on mucilaginous seeds

(57) Abstract: Provided is a synbiotic food/feed composition including a mucilaginous seed component. The composition embodies superior nutritional, chemical and biological characteristics, which alone, and in combination, act to improve the well being of humans and animals. The methods of preparation and application of the synbiotic food/feed composition for human and animals are also provided.

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Method and application of synbiotic food/feed composition for humans and animals.

DESCRIPTION

FIELD OF THE INVENTION

[0001] The present invention relates to the field of functional foods, nutrition, biologically active fermented functional foods with synbiotic properties, and more specifically to a method of bioactivation mucilaginous seed, synbiotic food/feed composition based on bioactivated mucilaginous seed, and use thereof.

BACKGROUND

[0002] Probably, we live now longer and happier than ever (Ruut Veenhoven, 2004) In the modern world, where human life expectancy is vastly prolonged, the importance of quality of life arises as never before and is directly linked to nutrition and the well being.

[0003] At the same time, the population of both humans and domestic animals is influenced by environmental factors, eating habits and a naturally (due to aging) occurring decline in digestive functions dramatically affecting their well being. "Foods transfer their power to us when we digest and assimilate them "(Lynn Keegan, 2001). Therefore the aging and health-conscious consumer is constantly looking for healthy choices of food products.

[0004] To find, or to create, an ideal and easy-to-digest food is not an easy task. Within the scope of functional foods, a relatively new group of products called synbiotic foods, is such an easy-to-digest food source. In synbiotic foods, both prebiotic and probiotic benefits are combined in one food product. When properly prepared and consumed, they may stimulate the immune system and promote gastrointestinal and colon health, thereby enhancing quality of life and well being of humans and animals (Sharon Gerdes, 2005)

[0005] However, many of current synbiotic compositions mentioned in the following patent applications are difficult to formulate, produce, store, or apply (US No. 2003-0147857; US No. 2004-0072794; US No. 2006-0093592; US No 2007-0166433; RU No. 2006-143117)

[0006] A great demand therefore exists for novel functional foods which are a rich, balanced, stable, effective and economical synbiotic composition. This new demand also requires the invention of methods of preparation and administration of this new category of synbiotic food/feed for humans and animals.

BRIEF SUMMARY OF THE INVENTION

[0007] It is an object of the invention to provide a synbiotic food/feed composition for the in the well being of humans and animals in an economical and effective way.

[0008] The present invention includes a synbiotic food/feed composition and methods of preparation and application thereof, that result in the improvement of the well being humans and animals.

[0009] The synbiotic food/feed composition is prepared in a process of bioactivation of mucilaginous seed to a prescribed point where a desired synbiotic food/feed composition is achieved and can be consumed fresh or dry (stabilized) or in prepared foods.

[0010] The present composition is based on bioactivated mucilaginous seed and contains a combination of probiotic components (with log 8-9 CFU in suggested serving), prebiotic components (with improved ratio of fibers), essential fatty acid components, vitamin components, enzyme components, mineral components, phytochemical components, and nutritional components.

[0011] Further, this synbiotic food/feed composition might be enriched with nutraceutical components.

[0012] The present synbiotic food/feed composition is reasonable in cost, stable in ambient environment without refrigeration, and easy to consume or use as a functional food or as a functional food ingredient in consumer products.

[0013] Next, the synbiotic food/feed composition is administered to human or animal.

[0014] The present invention results in beneficial change in well being including but not limited to, digestive and immune function, enhanced ability to cope with the physical demands of emotional and /or physical stress, energy level, bowel regularity; facilitating healthy weight loss;

a reduction in the levels of toxins in a gastrointestinal tract, a lessening of arthritic symptoms linked discomfort, an improvement of skin and hair condition, a regulation of blood glucose levels, an improvement in the levels of LDL and HDL cholesterol, a lessening of “dry eye” syndrome, or combination thereof in a said human or animal.

[0015] The present invention contributes to both male and female health, and to the offspring of human and animals born from those consuming a synbiotic food/feed composition.

DEFINITION OF TERMS

[0016] The following definitions apply throughout the present specification:

[0017] The term “synbiotics” refers to food products combining probiotics and prebiotics

[0018] The term “probiotics” refers to live organisms which when administered in adequate amounts confer a health benefit on the host

[0019] The term “prebiotics” refers to substances that stimulate the growth and activity of beneficial bacteria (probiotics) of the intestinal flora

[0020] The term “functional food” refers to conventional foods that are demonstrated to have physiological benefits and/or reduce the risk of chronic disease

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] Embodiments of the present invention will now be described, by way of example only, with reference to the attached Figures, wherein:

[0022] FIG. 1 shows a process flow diagram illustrating a method of preparing synbiotic food/feed composition, based on bioactivated mucilaginous seeds

[0023] FIG. 2 shows a process of enrichment and stabilizing probiotic in synbiotic composition based on mucilaginous seeds

[0024] FIG. 3 illustrates properties of flaxseed based synbiotic food/feed composition

DETAILED DESCRIPTION

[0025] Present method of preparation synbiotic food/feed composition is based on processing of mucilaginous seed including bioactivation (sequential fermentation, sprouting, malting) accompanied by drying.

[0026] The bioactivation of mucilaginous seed presents unique problems to traditional bio-processing methodologies. Specific areas of differences are in moisture level, temperature, and humidity.

[0027] Step 1: Fermentation. The ideal protocol for adding moisture to mucilaginous seeds is at a prescribed ratio of water volume to seed. Water is added in specific volume and over a period of time, with agitation based on skills those experienced in the art. Specifically designed machinery may also be used, until a desired level of fermentation is reached.

[0028] Step 2: Germination/Sprouting. Traditional methodologies of sprouting would suggest the soaking of the seed for a period of approximately 6 hours in water at approximately 68.degrees F. Due to the nature of mucilaginous seeds, this cannot be done without damaging of their unique properties. Adding equal quantities of water to mucilaginous oil seeds produces a porridge-like mixture and may cause the seed to die. The ideal protocol for adding moisture to mucilaginous oil seeds is at a prescribed ratio of water volume to seed. Water is added in specific volume and over a period of time, with agitation based on skills those experienced in the art. Specifically designed machinery may also be used, until a desired level of germination/sprouting is reached.

[0029] Step 3: Malting. By manipulation of the oxygen supply and temperature, those experienced in the art are able to regulate level of probiotic bacteria and prebiotics in malting seed.

[0030] Step 4: Drying is applied to bioactivated mucilaginous seeds during further processing. Low temperatures are combined with regulated airflow in specifically designed machinery to cause rapid dehydration and stabilization of synbiotic food/feed composition.

[0031] Grinding, milling, powdering or micro-cutting can be additional steps of processing, customized synbiotic food/feed compositions for further consumption.

[0032] A protective shield or coat for biogenic components of the bioactivated mucilaginous seeds is created during processing. The novel process causes a Bio-encapsulation of the biogenic components in a cell-friendly coating. The resulting bio-encapsulated beneficial bacteria, enzymes, vitamins, essential fatty acids, colloidal minerals, nutrients and nutraceuticals are delivered and digested in a more bio-available fashion during passage through the digestive system of human or animals.

[0033] A synbiotic food/feed composition comprises the following constituents: probiotic component, prebiotic component, essential fatty acid component, vitamin component, enzyme component, mineral component, phytochemical component, nutraceutical component, nutritional component, and/or a combination thereof.

[0034] Probiotic component in synbiotic food/feed composition is selected from the probiotic cultures consisting of soil-based microorganisms accompanied by *Lactobacillus*, *Bifidobacterium*, *Saccharomyces*, other probiotic cultures, and/or combination thereof, with log CFU no less than 7 per gram of synbiotic food/feed composition, or more than 8 in suggested serving. Probiotic component is stabilized, immobilized and bio-encapsulated

[0035] A prebiotic component is selected from a fiber of plant origin, with improved formula/ratio of soluble/non-soluble fibers

[0036] Essential fatty acids component is selected from the group consisting of Omega-3 polyunsaturated fatty acid, Omega-6 polyunsaturated fatty acid, Omega-9 polyunsaturated fatty acid, and/or a combination thereof, and is present in bio-encapsulated form preventing essential fatty acids from rapid oxidation.

[0036] A vitamin component in synbiotic food/feed composition comprises of at least one vitamin selected from a group consisting of vitamin A, B, C, D, E, folic acid, choline, pantothenic acid, niacin, and/or combination thereof. Vitamin component is further characterized as bio-encapsulated

[0037] Enzyme component of synbiotic food/feed composition comprises at least one enzyme

selected from a group consisting of lipase, protease, cellulase, amylase, and other active enzymes, and/or a combination thereof, where enzyme component is further characterized as bio-encapsulated

[0038] Mineral component of synbiotic food/feed composition comprises at least one mineral selected from a group consisting of an iron, calcium, copper, chromium, boron, magnesium, iodine, potassium, sodium, zinc, and/or combination thereof, in colloidal and bio-encapsulated form.

[0039] A phytochemical component in synbiotic food/feed composition is selected from a group which includes lignans, sulphoraphane, other phytochemicals, and/or a combination thereof, in bio-encapsulated form.

[0040] A nutraceutical component of synbiotic food/feed composition comprises at least one nutraceutical selected from a group, which includes stevia, other nutraceuticals, and/or a combination thereof, and is bio-encapsulated.

[0041] Nutritional component of synbiotic food/feed composition is at least one component is selected from vegetable protein, carbohydrates, lipids, or combination thereof, in bio-encapsulated form..

[0042] The synbiotic food/feed composition is stable for at least one year when stored at ambient temperature and ambient humidity level.

[0043] The synbiotic food/feed composition might be in a form of seed, ground/milled/micro-cut dosage, tablet or capsule.

[0044] The synbiotic food/feed composition may be consumed by human as a food product, or included as a functional ingredient in consumer products which may include but are not limited to dry soup mix, dry sauce mix, dry energy drink mix, dry baby food mix, cereals, porridge, pastas, chips, crackers, dry breads, dry cake mix, dry pudding mix, yogurts, frozen yogurts, frozen meat and fish products, frozen meat replacement products, ice creams, frozen pizzas, breads, cookies, energy bars, cheeses, spreads, butters, peanut butters, chocolates, nanofoods

[0045] The synbiotic food/feed composition, when consumed by animals (bovine, caprine, porcine, equine, fish, and birds), can be used as a single feed product, a functional feed ingredient, in the form of but not limited to powder, treats or cookies, pellets, chewable snacks, and feed through for meat and dairy products from animals, consuming the synbiotic food/feed composition.

[0046] The application of the synbiotic food/feed composition results in a beneficial change in the well being including but not limited to, digestive and immune function, enhanced ability to cope with the physical demands of emotional and /or physical stress, energy level, bowel regularity; facilitating healthy weight loss; a reduction in the levels of toxins in a gastrointestinal tract, a lessening of arthritic symptoms linked discomfort, an improvement of skin and hair condition, a regulation of blood glucose levels, an improvement in the levels of LDL and HDL cholesterol, a lessening of “dry eye” syndrome, or combination thereof in a said human or animal. It contributes to both male and female health, and to the next generation of human and animals born from those consuming a synbiotic food/feed composition.

EXAMPLES

[0047] The following examples are offered to illustrate, but not to limit, the claimed invention

Example 1

Pilot Study for evaluation of the flaxseed based synbiotic composition in individuals with diverse health issues

[0048] A study was conducted to evaluate the effect of a flaxseed based synbiotic composition comprising the following constituents: probiotic component, prebiotic component, essential fatty acid component, vitamin component, enzyme component, mineral component, phytochemical component, and nutritional component, in patients of 4 doctors at the University of Alabama Genesis Park laboratory. Each doctor was assigned five patients with various medical conditions. Flaxseed based synbiotic composition has been consumed twice a day, in amount of 10g, with additional water intake, for a period of 6-7 months. The following results are what was reported using venous blood chemistries and a medical, sociological and psychological inventory of the patient's life history. This was a very unusual clinical study due to the fact that there are so many

variables and factors to check medically, socially and psychologically. Vast improvements can be seen in all patients musculoskeletal conditions but substantial improvements in other various areas such as acid reflux, vision problems, memory and cognitive functions, lipid profiles, hypertension and many other age-related conditions can be seen as well. Investigators feel that the flaxseed based synbiotic composition has many unknown pharmacological secrets yet to uncover. The results using flaxseed based synbiotic composition were astounding as can be seen from the following cases.

[0049] Female, age 53. Reports her hypertension is completely in remission. Her migraine and vision problems are also much better. She has had a 49.5% improvement in her fluorescent antibody titers and her mobility is now at 98.5%

[0050] Male, age 61. This patient has chronic back pain with herniated discs, cataracts and severe acid reflux. After taking the flaxseed based synbiotic composition, he had little or no back pain and his gait has improved greatly. He reports that he can now go back to work. His cataracts are so improved that he feels that he may no longer need the surgery recommended by his doctor. Patient has had a 50% overall improvement in his immune system depleted from the gaseous environment in his workplace. He now feels so much better. This patient has had a 49.5% improvement in his Rh-factor, sedrate profile and uric acid profiles. He now reports no acid reflux.

[0051] Female, age 31. Patient first reported with chronic rheumatoid arthritis, treated with Vioxx and Bextra, back problems with chronic bone disease and sever acid reflux. She also has had problems with her blood sugar vacillating from 210 back to 64. Using flaxseed synbiotic formula, she now reports that she is completely off all medicines. She is more mobile and can work full-time. A 59% improvement is reported in her Rh-factor, qualitative profiles, acid reflux. Her 24-hour fasting blood sugar profiles are all now normal and her overall immune system is vastly improved.

[0052] Female, age 16, who requires special education teachers and a special physical education trainer. Her mother first reported that her daughter has adolescent rheumatoid arthritis with chronic bone disease and requires two canes to walk and maintain her balance, significant vision problems and severe acid reflux. After taking flaxseed based synbiotic composition, her mother reports that her daughter has no problems with acid reflux and her gait is now considerably

improved. Her Rh-factor and qualitative venous blood profiles have improved 42%. Her immune system is much stronger and her vision problems are vastly improved.

[0053] Male, age 75. Patient reported severe bone disease with high Rh-antibody titres and very high uric acid profiles with severe gout, and severe acid reflux. After adding the flaxseed synbiotic composition and no other changes, he has a 48% improvement in his overall profiles both in movement and pain. There is vast improvement in all his antibody titres and his uric acid profiles. He is now free of acid reflux for the first time in over 50 years.

[0054] Male, age 71. After only adding the flaxseed synbiotic composition from the beginning of study, this severely impaired doctor who reported to investigator with high high Rh-facotr antibody titers and possibly the worst rippling arthritis they ever have seen has vast improvement over a period of several months. He had to retire when he was 40 years old due to his crippling arthritis and his immune system greatly impaired. He can now function on a somewhat normal basis. A 35% improvement in his overall mobility and his general outlook on life can be reported. He attributes the flaxseed synbiotic composition as a Godsend.

[0055] Female, age 44. First reported to the investigator with chronic shoulder, back and joint pain, very high Rh-antibody titers and high uric acid profiles with chronic gout. She reported with a weight problem being 80 pounds overweight. Since being on study, she has lost 46 pounds and reports great improvement in her joint pain. Her sedrate profiles are now normal and she hasn't lost any time off work since she began using the flaxseed synbiotic composition.

[0056] Female, age 54. She reported with chronic back pain, high LDL and low HDL and very high triglycerides. She also reported that her overall cognitive ability was not good. Her memory was getting bad and she was very worried that she would get some type of brain disease- i.e. Parkinsons, etc. She reports that her mother has Parkinson's. She began using the flaxseed synbiotic composition at the beginning of the study and she now reports that her memory has vastly improved and her cognitive ability is almost 100%. Her lipid profiles are now normal with an overall ratio of 2.5 compared to the national average. She reports her back pain much improved. An overall improvement of 56% in her immune system and all her venous blood profiles can be seen.

[0057] Male , age 52. He reported to investigator with severe joint pain and high blood pressure

which was very episodic. Sometimes his hypertension was a stroke levels if he did not take medication. From the start of this pilot study and no changes except adding the flaxseed synbiotic composition, he reports his blood pressure is normal without medication. He has lost 46 pounds and is without pain in all of his joints. Investigator reports a 62% improvement in all of his profiles plus his blood sugar is now normal in the 150 range and his weight loss is a big plus.

[0058] Male, age 60. He reports to the investigator with chronic back pain, high stress, use of laxatives all of his life and a very overall toxic look and feel. There is a history of colon cancer in his family. After beginning the flaxseed synbiotic composition, investigator sees a vast improvement in his overall venous blood profiles, he no longer uses laxatives, his stress level is much improved and he reports that his back pain is much better. He no longer feels toxic and looks and feels so much better. A 69% improvement in all of his profiles both physically and psychologically is reported.

[0059] Male, age 32. He reports to investigator with a history of cancer in his family and a high PSA, high Rh-antibody titers and severely overweight. Only adding the use of the flaxseed synbiotic composition, some amazing results are reported. His titers are now normal and his PSA has gone down from a high 10 to a low 2.1. He has lost 50 pounds and now evacuates twice a day as opposed to once every five days. A 72% improvement in this patient's overall blood profiles especially his PSA (prostatic specific antigen) is reported. It seems that he is no longer facing prostate cancer.

[0060] Female, age 42. She reports to investigator with upper back pain and a chronic condition of recurring colds and flu. She has been on flaxseed synbiotic composition since the beginning of the study and now reports that her immune system is so vastly improved that she has not had any cold or flu. She no longer has any joint pain and is less toxic. She now evacuates every day as opposed to only once every six days. A 62% improvement in her blood profiles and immune system is reported. She also reports her ability to think and solve problems is vastly improved. Investigator suggests, it happens due to the high concentrations of vitamins E, C and choline in flaxseed synbiotic composition.

[0061] Female, age 40. She reports to investigator with a history of colon and breast cancer in her family as well as chronic back and joint pain. A busy lady who evacuates every five days.

She had a high CEA antibody titer and an abnormal PAP smear. After using flaxseed synbiotic composition all her titers are normal and she evacuates sometimes threetimes a day. Also her joint pain is gone and she reports that she is less toxic with more energy. A 52% improvement overall of her venous blood profiles is reported.

[0062] Male, age 26. He reported to investigator with high lipid profiles, severe acid reflux and joint pain. Also, he has some episodic blood sugar problems. After using the flaxseed synbiotic composition, his blood profiles are reported as normal- i.e. normal LDL, HDL and triglycerides –and his acid reflux is vastly improved. His blood sugars are no longer fluctuating, his joint pain is greatly improved and he has lost 36 pounds. A 42% improvement in his overall blood profiles is reported.

[0063] Male, age 45. He suffers from chronic stomach and lower bowel problems. He reports that he feels that he has a chronic sour stomach in his own diagnosis. He also reports lower back pain and high uric acid profiles. After using the flaxseed synbiotic composition from the start of our program, he now reports to investigator with no acid reflux and vast improvement in his stomach problems. He now has normal bowel movements. His uric acid profiles are now normal and a 46% improvement in his overall blood profiles is reported. He even reports his hair growing better too.

[0064] Male, age 54. This patient reported to investigator with a very high Rh-factor qualitative profile, severe arthritis in his knees and back and a history of cancer in his family. He has been using the flaxseed synbiotic composition since the beginning of the study. He now reports a vast improvement in his knee pain and his qualitative profiles are now normal. He now evacuates every day as opposed to once every six days. His overall blood profiles and titers are all normal and he has lost 33 pounds. He no longer is on medication that he has been taking for over 15 years. An overall improvement of 54% is reported.

[0065] Male, age 68. Patient reports to research team with elevated joint pain and a heavy use of laxatives. His body seems to be very toxic and he is very tired all the time with no energy. After he has been discouraged the use of laxatives and encouraged to keep well hydrated and use flaxseed synbiotic composition daily, his bowel movement became normal and his toxicity and energy levels are vastly improved. He feels so much better and says “I will never be without flaxseed synbiotic composition”. Computer evaluates his overall improvement to be about 48%.

[0066] Female, age 46. This lady reports to investigator with long-acting fibromyalgia which is a very painful muscle condition that effects the joints and the muscle tissue next to the bones. She is in constant pain and has had to take a psychotropic drug called Methadone which is very addictive. After using flaxseed synbiotic composition twice a day with extra water intake and aqua therapy, investigator had seen a 20% improvement in her overall pain and she has decreased her use of Methadone. If they can stop her Methadone and use only flaxseed synbiotic composition, it would be a great overall improvement in the overall treatment of pin. Investigator is very excited about the results with this patient.

[0067] Male, age 39. The patient reports to investigator with a severe hair loss and a chronic skin conditions much like acne. After using the flaxseed synbiotic composition for more than 6 months, his hair loss stopped and his acne has completely cleared up. Investigator feel that his overall toxic condition was his use of laxatives and his chronic constipation. He now evacuates twice a day and he is now not longer toxic. His overall blood profiles are now normal and he has very high energy. An overall 43% improvement is reported.

[0068] Male, age 45. This patient reported to investigator with upper joint pain and Rh-factors that indicate that he has very severe arthritis especially in his joints. Investigator started him and flaxseed synbiotic composition at the beginning and he is vastly improved. He has lost 39 pounds and is no longer toxic. He reports that he is no longer lethargic and can work a full day. An overall improvement in his blood profiles of 40% is reported.

Example 2

A Preliminary Study for Evaluation of the flaxseed synbiotic food composition in immune compromised individual.

[0069] A study was conducted in Siberian State Medical University, Tomsk, Russian Federation. The goal of the preliminary assay was to evaluate the effect of a flaxseed based synbiotic composition, in volunteer female patient diagnosed with chronic spastic colitis. Patient (female, age 27) has such disorder for more than 10 years, being accompanied by other health issues.

[0070] Consuming flaxseed synbiotic composition, dry or fresh, 1 tablespoon daily for a month, patient kept a dairy describing her symptoms. She also undergo analysis of immune status (in

blood samples) and intestinal bacterial community (in fecal samples), at the beginning, after month of consuming, and month after termination of supplementation.

[0071] Investigator – immunologist, MD, Ph.D., admitted an impressive improvement in well being of the patient, activation of her immune system and balancing of the intestinal microflora towards normal formula during period of the administration flaxseed synbiotic composition, and after. Usually, it can be seen only during therapy with administration of both probiotic and prebiotic medicines, the investigator says.

[0072] In addition to analytical data, the patients dairy contains comments regarding normalizing of bowel movement and elimination of her abdomen pain in 2 weeks after beginning of administration of flaxseed synbiotic composition. She also experienced relief of both menstrual pain and symptoms of cold happened during the trial.

Example 3

Home Study for flaxseed based synbiotic composition in dogs and cats

[0073] Female dog, cross of Alaskan Malamute and Border Collie, 8.5 years old, 20lbs. Being fed regular diet based on cheapest brands, with only supplementation of flax seed based synbiotic composition when having residue of fat from prepared meat (as a treat), has beautiful luxurious coat, healthy weight, “puppy” look and attitude. Seldom occurring bloating typically disappears in 1 hour after consuming of 1 teaspoon of flax seed based synbiotic composition.

[0074] Indoor male cat, 6 years old, 7 lbs. Being fed regular diet combining canned and dry food of the cheapest brands, with only supplementation of flax seed based synbiotic composition, ½ teaspoon on a weekly basis, has healthy coat and weight, no hair ball issues. Once occurred in the past inflammation of the urinary system never re-occurred during supplementation of flaxseed based synbiotic composition.

[0075] Obviously, many adaptations and modifications may be made within the scope of the above-described invention.. Accordingly, it will be appreciated by those skilled in the art that within the scope of the appended claims, the invention may be practiced other than has been specifically described with reference to preferred embodiments and examples thereof.

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CLAIMS

1. A synbiotic food/feed composition, comprising the following constituents: a probiotic component, a prebiotic component, an essential fatty acid component, a vitamin component, an enzyme component, a mineral component, a phytochemical component, a nutraceutical component, and a nutritional component, wherein each constituent is present in such proportion that, when prepared and administered, the synbiotic food/feed composition improves the well being of humans and animals.
2. The *method* of claim 1 wherein the synbiotic food/feed composition is prepared in a process of complex bioactivation of mucilaginous seed to a prescribed point where a desired synbiotic food/feed composition is achieved, and then subjected to a drying process that stabilizes the synbiotic food/feed composition
3. The method of claim 2 wherein said mucilaginous seed is selected from a seed group consisting of oil seeds, and or combination thereof with other seed or seeds.
4. The method of claim 2 wherein said seed is mixed with a liquid substance
5. The method of claim 4 wherein said liquid substance is water or water with other liquid components.
6. The method of claim 5 wherein said liquid substance is a mixture of water with other components, selected from group of probiotics, minerals, nutraceuticals, and/or a combination thereof.
7. The method of claim 2 wherein said mucilaginous seed is fermented during solid state fermentation under controlled moisture, temperature and oxygen supply, to the point when desired synbiotic food/feed composition is achieved.

8. The method of claim 2 wherein said mucilaginous seed is germinated or sprouted under controlled conditions
9. The method of claim 2 wherein said mucilaginous seed is malted using a controlled combination of moisture, temperature, oxygen supply, to the point when desired synbiotic food/feed composition is achieved.
10. The method of claim 2 wherein the synbiotic food/feed composition that has been prepared in a process of complex bioactivation of mucilaginous seed to a prescribed point where a desired synbiotic food/feed composition is achieved, is then subjected to a drying process that stabilizes the synbiotic food/feed composition
11. A **synbiotic food/feed composition** comprising the following constituents: probiotic component, prebiotic component, essential fatty acid component, vitamin component, enzyme component, mineral component, phytochemical component, nutraceutical component, nutritional component, and/or a combination thereof.
12. The composition of claim 11 wherein said probiotic component is selected from the probiotic cultures consisting of soil-based microorganisms accompanied by Lactobacillus, Bifidobacterium, Saccharomyces, other probiotic cultures, and/or combination thereof, with log CFU no less than 7 per gram of synbiotic food/feed composition..
13. The composition of claim 12 wherein said probiotic component is stabilized
14. The composition of claim 13 wherein said probiotic component is further characterized as immobilized and bio-encapsulated
15. The composition of claim 11 wherein said prebiotic component is selected from a fiber of plant origin
16. The composition of claim 15 wherein said prebiotic component is further characterized as improved formula/ratio of soluble/non-soluble fibers
17. The composition of claim 11 wherein said essential fatty acids component is selected from

the group consisting of Omega-3 polyunsaturated fatty acid, Omega-6 polyunsaturated fatty acid, Omega-9 polyunsaturated fatty acid, and/or a combination thereof

18. The composition of claim 17 wherein said essential fatty acids component is further characterized as bio-encapsulated
19. The composition of claim 11 wherein said vitamin component comprises of at least one vitamin selected from a group consisting of vitamin A, B, C, D, E, folic acid, choline, pantothenic acid, niacin, and/or combination thereof
20. The composition of claim 19 wherein said vitamin component is further characterized as bio-encapsulated
21. The composition of claim 11 wherein said enzyme component comprises at least one enzyme selected from a group consisting of lipase, protease, cellulase, amylase, and other active enzymes, and/or a combination thereof
22. The composition of claim 21 wherein said enzyme component is further characterized as bio-encapsulated
23. The composition of claim 11 wherein said mineral component comprises at least one mineral selected from a group consisting of an iron, calcium, copper, chromium, boron, magnesium, iodine, potassium, sodium, zinc, and/or a combination thereof
24. The composition of claim 23 wherein said mineral component is further characterized as a colloidal mineral
25. The composition of claim 24 wherein said mineral component is further characterized as bio-encapsulated
26. The composition of claim 11 wherein said phytochemical component is selected from a group which includes lignans, sulphoraphane, other phytochemicals, and/or a combination thereof

27. The composition of claim 26 wherein said phytochemical component is further characterized as bio-encapsulated
28. The composition of claim 11 wherein said nutraceutical component comprises at least one nutraceutical selected from a group, which includes stevia, other nutraceuticals, and/or a combination thereof.
29. The composition of claim 28 wherein said nutraceutical component is further characterized as bio-encapsulated
30. The composition of claim 11 wherein said nutritional component is at least one component is selected from protein, carbohydrates, lipids, or combination thereof.
31. The composition of claim 30 wherein said nutritional component is further characterized as bio-encapsulated
32. The composition of claim 31 wherein said protein is a vegetable protein
33. The composition of claim 11 wherein said composition is stable for at least one year when stored at ambient temperature and ambient humidity level.
34. The composition of claim 11 in a seed form.
35. The composition of claim 11 in a powder or otherwise ground/milled/micro-cut dosage form.
36. The composition of claim 11 in tablet form
37. The composition of claim 11 in capsule form
38. The composition of claim 11 wherein consumer is human.
39. A food product for human consumption containing at least in part the synbiotic food composition of claim 11.

40. A composition of claim 39 wherein said food product is included as a functional ingredient in consumer products which may include but are not limited to dry soup mix, dry sauce mix, dry energy drink mix, dry baby food mix, cereals, porridge, pastas, chips, crackers, dry breads, dry cake mix, dry pudding mix, yogurts, frozen yogurts, frozen meat and fish products, frozen meat replacement products, ice creams, frozen pizzas, breads, cookies, energy bars, cheeses, spreads, butters, peanut butters, chocolates, nanofoods
41. The composition of claim 11 wherein the consumer is an animal
42. A feed product for animal consumption containing in part and as a functional feed ingredient, the synbiotic food composition of claim 11
43. A composition of claim 42 wherein said feed product is in the form of but not limited to powder, treats or cookies, pellets, chewable snacks.
44. The composition of claim 41 wherein said animal is selected of groups consistent of bovine or caprine
45. A composition of claim 44 wherein the food product is in the form of dairy products manufactured from the milk of said animals that have consumed a feed product containing in part and as a functional feed ingredient the synbiotic food composition of claim 11
46. The composition of claim 41 wherein the said animal is selected from a group comprising bovine, caprine, porcine, equine, fish, and birds
47. A composition of claim 46 wherein the said food product is in the form of meat products manufactured from said animals that have consumed a feed product containing in part and as a functional food ingredient the synbiotic food composition of claim 11
48. The composition of claim 41 wherein the said animal is selected from a group comprising fish and birds
49. A composition of claim 48 wherein said food product is in the form of eggs produced by said birds and said fish that have consumed a feed product containing in part and as a

functional food ingredient the synbiotic food composition of claim 11

50. The composition of claim 41 wherein the said animal is selected from a group comprising canine, feline, and equine.
51. A **method** for improving well being of humans and animals comprising the step of administering to the subject a controlled amount of the composition of claim 1, wherein each constituent is present in controlled proportion, such that, when administered, is effective in improving well being in humans and animals.
52. The method of claim 51 wherein said subject is human
53. The method of claim 52 wherein said method results in a beneficial change in well being including but not limited to, digestive and immune function, intestinal microflora; enhanced ability to cope with the physical demands of emotional and/or physical stress, improved energy level, bowel regularity; facilitating healthy weight loss; a reduction in the levels of toxins in a gastrointestinal tract, a lessening of arthritic symptoms linked discomfort, an improvement of skin and hair condition in particular hair growth and lessening of inflammatory skin conditions, a regulation of blood glucose levels, an improvement in the levels of LDL and HDL cholesterol, a lessening of "dry eye" syndrome, or combination thereof in a said human.
54. The method of claim 52 wherein said human is an adult male
55. The method of claim 54 wherein said method lessens the impact of enlarged prostate, prostatic hyperplasia in adult males
56. The method of claim 52, wherein said human is a female.
57. The method of claim 56, wherein said method lessens menstrual pain, menopause symptoms, and contributes to the health of the children born from said female.
58. The method of claim 51 wherein said subject is animal
59. The method of claim 58 wherein said method results in a beneficial change in well being

including but not limited to, digestive and immune function; enhanced ability to cope with the physical demands of emotional and/or physical stress, improved energy level, bowel regularity, cleansing of hairballs; maintaining of healthy weight, a reduction in the levels of toxins in a gastrointestinal tract, a lessening of arthritic symptoms linked discomfort, a flexibility, an improvement of skin and hair / fur /feather condition, or combination thereof in a said animal.

60. The method of claim 59 wherein said method contributes to the health of the litter produced from said animal.

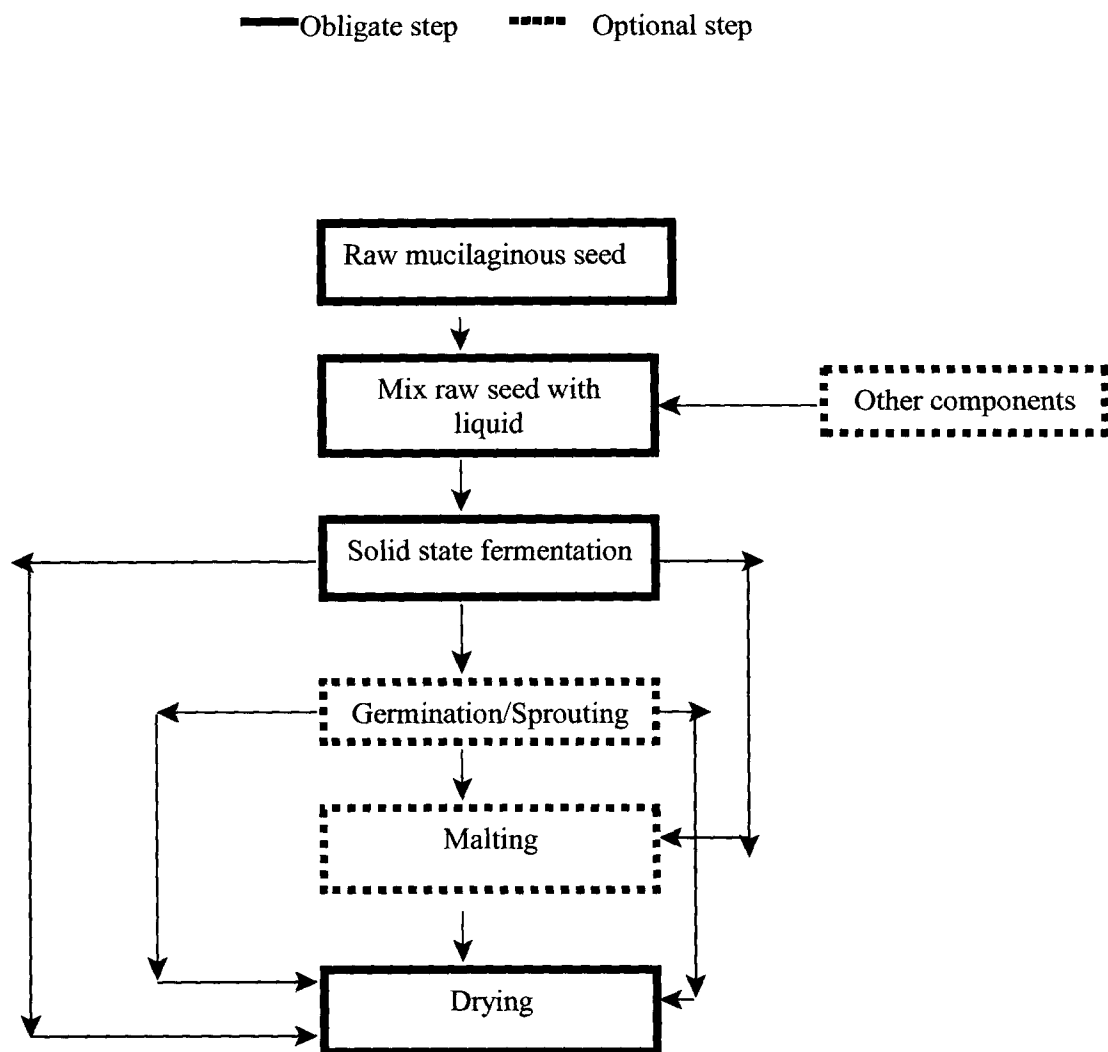
FIG.1 Bioactivation and stabilizing of the mucilaginous seed (a process flow)

FIG.2

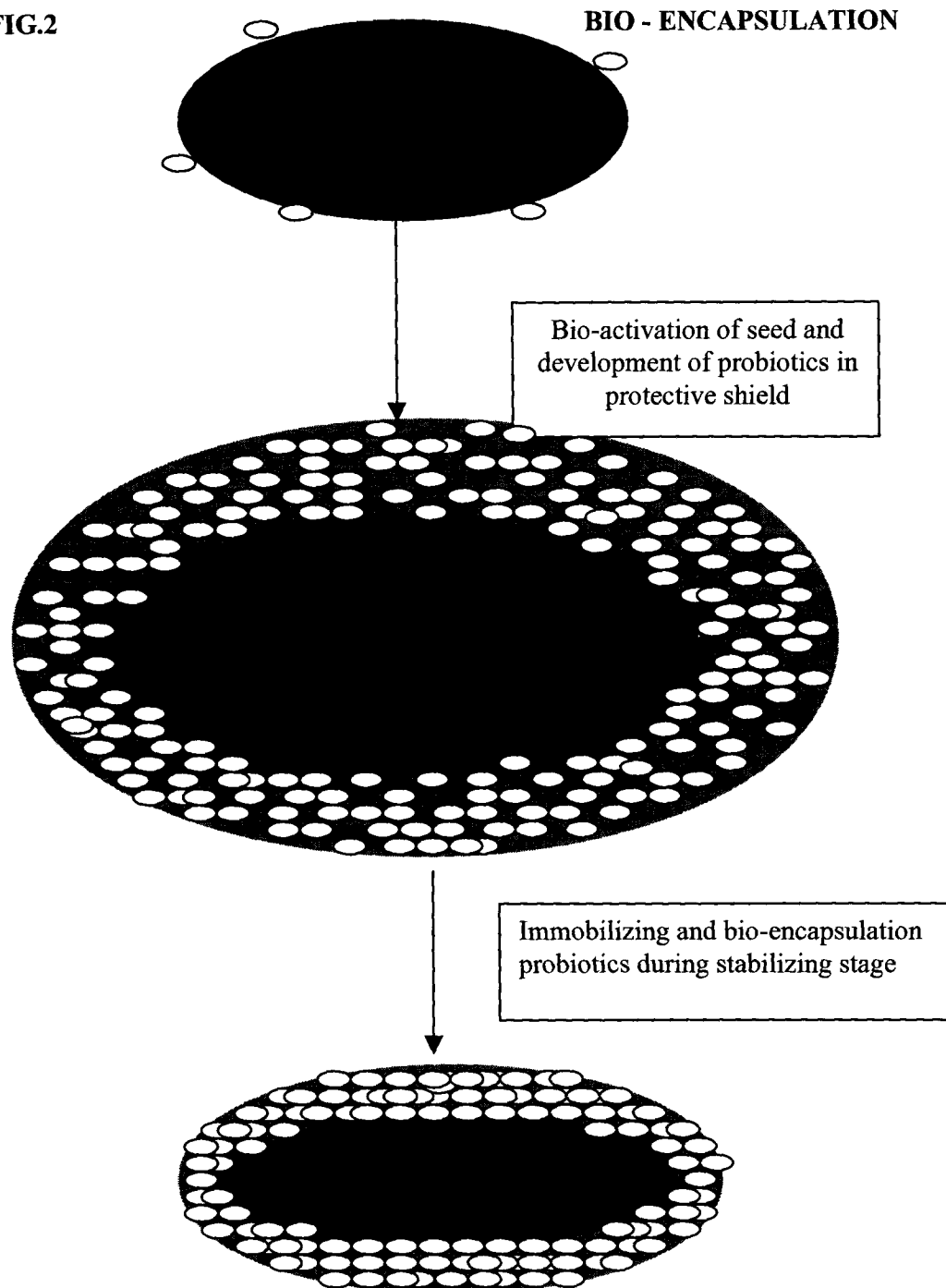


FIG.2 Process of enrichment and stabilizing probiotics in synbiotic composition based on mucilaginous seeds

FIG. 3**Synbiotic flax seed food/feed composition****Nutritional Information** g/100g*

Calories / Calories X (X kJ)	550/2300kJ
Fat / Lipides X g	37.4
Saturated / Sature X g	3.4
+ Trans / trans X g	0
Omega- 6 Polyunsaturated	5.9
Omega- 3 Polyunsaturated	21.0
Monounsaturated	7.6
Cholesterol / Cholesterol X mg	0
Sodium/Sodium X mg	71
Potassium X mg	805
Carbohydrate / Glucides X g	37.5
Fibre / Fibres X g	30.4
Sugar / sucres X g	4.1
Sugar Alcohol X g	
Starch / Amidon X g	
Protein / Proteines X g	21.5
Vitamin A / Vitamine A	3 RE/100g
Vitamin C / Vitamine C	20mg
Calcium / calcium	220 mg%
Iron / Fer	6.7 mg%

Enzyme Analysis***

Enzyme	Units	Mean	% Increase
AMYLASE	DU/G	28.51	5.63
LYPASE	LU/G	411.56	280.51
PROTEASE	PU/G	15.38	515.33
CELLULASE	CU/G	510.1	617.44

Analysis conducted by:

* Lipid Analytical Laboratories, UoG , Guelph, Ontario

** Michro-Chem Laboratory Inc., Mississauga, Ontario, Canada

*** Canadian Analytical Laboratories Inc., Scarborough, Ontario

Note: 1) Nutritional values may vary due to natural variation of raw materials
 2) Values are averaged over multiple batches and are therefore approximate and relative.
 Individual batches will vary slightly

Microbiological Analysis **

	Typical analysis	Maximum tolerated	Measurement unit
SPC	> 7 log	NA	cfu/gm
Coliforms	3 to 5 log	5 log	cfu/gm
Mold and Yeast	3 to 4 log	3 to 4 log	cfu/gm
Salmonella spp.	0	0	
E. coli 0157	0	0	

NOTE: Microbial data typical for category "Fermented food"**Physical Characteristics****Dimension** (example granulation, height/length/width, diameter, etc) where applicable

Granular powder - Mixed sizes to less than 20 mesh

Appearance

Brownish or yellowish powder

Odour

Nutty aroma

Water Activity or Moisture Content

Less than 4.5% moisture

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2008/000021

A. CLASSIFICATION OF SUBJECT MATTER

IPC: **A61K 45/06** (2006.01) , **A23K 1/16** (2006.01) , **A23K 1/165** (2006.01) , **A23L 1/10** (2006.01) , **A23L 1/185** (2006.01) , **A23L 1/186** (2006.01) (more IPCs on the last page)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A61K 45/06 (2006.01) , **A23K 1/16** (2006.01) , **A23K 1/165** (2006.01) , **A23L 1/10** (2006.01) , **A23L 1/185** (2006.01) ,

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)

Canadian Patent Database (*), Delphion (*), PubMed (*), Scopus (*)

(*: flaxseed*, flax_seed, synbiotic, prebiotic, probiotic, mucilaginous, nutrition, malting, fermentation, germination)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CA 2,452,997 (D. BARKER) 16 January 2003 (16-01-2003) see entire document, and specifically page 4, lines 10-22; page 8; ex. 1-2; Table 5; claims	1-60
Y	WO 07/107638 (K. SALMINEN et al.) 27 September 2007 (27-09-2007) see entire document, and specifically page 2, line 27 - page 3, line 2; ex. 2	1-60
Y	CA 2,395,253 (R.M. DELRUE et al.) 5 July 2001 (05-07-2001) see entire document, and specifically page 5, line 32 - page 7, line 30; claims 1-3	1-60
X	WO 07/150047 (S. SUBRAMANIAN et al.) 27 December 2007 (27-12-2007) claims 1, 2, 7, 8, 11, 12, 21-25, 29, 30	1, 11-60

[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :
 "A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier application or patent but published on or after the international filing date
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
 "&" document member of the same patent family

Date of the actual completion of the international search

18 August 2008 (18-08-2008)

Date of mailing of the international search report

2 October 2008 (02-10-2008)

Name and mailing address of the ISA/CA
 Canadian Intellectual Property Office
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 50 Victoria Street
 Gatineau, Quebec K1A 0C9
 Facsimile No.: 001-819-953-2476

Authorized officer

Denis Bélanger 819- 934-6742

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/CA2008/000021**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons :

1. ☒ Claim Nos. : 51-60

because they relate to subject matter not required to be searched by this Authority, namely :

Although claims 51-60 are directed to a method of treatment of the human or animal body, the search has been carried out and based on the alleged effects of the composition therein.

2. ☒ Claim Nos. : 1-60

because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically :

Claims 1-60 relate to a composition or a method of using so many different and broad elements of the composition arising from the term "component", that a meaningful search of the claims is rendered impossible. The subject-matter of claims 1-60 is not adequately supported and has been the object of a partial search only. Consequently, the search has been established for the parts of the application which appear to be clear and supported under PCT Articles 5 and 6, namely a method of preparing a synbiotic food/feed composition, by an alleged four-step process, and said synbiotic food/feed composition made by the process : fermentation, germination/sprouting, malting and drying of mucilaginous flaxseeds, according to sections [0025]-[0030] of the description.

3. ☐ Claim Nos. :

because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows :

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claim Nos. :

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim Nos. :

Remark on Protest ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2008/000021

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CA 2,615,694 (L.T. CANHAM) 1 February 2007 (01-02-2007) page 2, lines 6-20; pages 19-22; claims 22-27	1, 11-60
X	CA 2,281,463 (S.H. ZLOTKIN) 26 February 2001 (26-02-2001) pages 5-7; page 7, line 28 - page 8, line 14; claims 1-13	1, 11-60
X	CA 2,604,838 (T.W.M. BOILEAU et al.) 19 October 2006 (19-10-2006) pages 3-10, 13, 18, 19; claims 1-8	1, 11-60

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CA2008/000021

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CA2008/000021

A23L 1/30 (2006.01) , *A23L 1/302* (2006.01) , *A23L 1/305* (2006.01) , *A23L 3/40* (2006.01)