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(54) Title: A NUTRIENT DENSE BAR AND A METHOD OF MANUFACTURING A NUTRIENT DENSE BAR

(57) Abstract: The present invention relates to edible nutrition bars, especially nutrition bars useful is satisfying daily nutritional requirements, and a method for its manufacture A nutrient dense bar comprising 60%wt to 70%wt of pitted dates, 30%wt to 35%wt of dried camel or Bovine milk powder, 0.6%wt to 1.3%wt of dehydrated date seed powder, 0.4%wt to 1%wt of salt, and 0.15%wt to 0.45%wt of multivitamin and multimineral composition. A method of manufacturing comprising the step of grounding multivitamin and multimineral composition tablet into a powder and date seeds into a powder; subsequent mixing of grounded powders with the salt and dried camel or Bovine Milk powder; blending of pitted dates and addition of the mix of the powders to the blended pitted dates; blending said mixture until the homogenized paste is obtained; and baking the paste in oven to about 175 degrees Celsius and for about 10 minutes.



## A NUTRIENT DENSE BAR AND A METHOD OF MANUFACTURING A NUTRIENT DENSE BAR

## DESCRIPTION

Field of the invention

[001] The present invention relates to edible nutrition bars, especially nutrition bars useful is satisfying daily nutritional requirements. The present invention also relates to manufacture of nutrient dense bars.

Background of the invention

[002] In today's fast-moving world it is increasingly difficult to accommodate in modern lifestyles a healthy diet with healthy nutritional balance which satisfies recommended daily nutrition (see table 1). Various meal replacers are emerging. The meal replacer products are generally products that are intended to be consumed as a single-serving food product, such as a bar or a drink etc to replace one or two meals per day.

[003] European patent publication No. EP1662902B1 discloses an edible composition comprising fat and at least one transition metal, divalent metal, or compounds thereof, and 0.01 to 50 %wt based on the weight of the fat, of emulsifier comprising a carboxylic ester group attached to a carbon chain and one or more free hydroxyl groups and comprising a mixture of esterified glycerol emulsifiers and esterified alginates.

[004] European patent publication No. EP1641358B1 discloses a nutrition bar comprising 10 %wt or more of soy and/or rice protein, at least one transition metal or transition metal or transition metal compound, and 2 %wt or more of a humectant.

[005] Russian patent publication No. RU2577043 discloses a nutrition bar having a core including a protein mixture combined with a binder in single structure. The core includes a milk component containing fine spherical protein particles.

Table 1

Recommended daily nutrition.

| <b>Essential Nutrients</b>   | <b>Recommended (g Per Day)</b> |
|------------------------------|--------------------------------|
| <b><i>Macronutrients</i></b> |                                |
| Water                        | 3700                           |
| Carbohydrates                | 225                            |
| Protein                      | 50                             |
| Fat                          | 45                             |
| Fiber                        | 30                             |
| <b><i>Vitamins</i></b>       | <b>Daily Value (mg)</b>        |
| Vitamin A                    | 0,9                            |
| Vitamin C                    | 100                            |
| Vitamin E                    | 15                             |
| Vitamin D                    | 0,02                           |
| Vitamin K                    | 0,12                           |
| Vitamin B1                   | 0,0012                         |
| Vitamin B2                   | 1,2                            |
| Vitamin B3                   | 16                             |
| Vitamin B5                   | 5                              |
| Vitamin B6                   | 1,7                            |
| Vitamin B7                   | 0,03                           |
| Vitamin B9                   | 0,4                            |
| Vitamin B12                  | 0,0024                         |
| <b><i>Minerals</i></b>       | <b>Daily Value (mg)</b>        |
| Sodium                       | 2300                           |
| Calcium                      | 1300                           |
| Iron                         | 20                             |
| Potassium                    | 5700                           |
| Phosphorus                   | 1250                           |
| Iodine                       | 0,15                           |
| Magnesium                    | 420                            |
| Zinc                         | 11                             |
| Selenium                     | 0,055                          |
| Copper                       | 0,9                            |
| Manganese                    | 2,3                            |
| Chromium                     | 0,035                          |
| Molybdenum                   | 0,045                          |
| Chloride                     | 2300                           |
| Choline                      | 550                            |
| <b><i>Amino Acids</i></b>    | <b>Daily Value (mg)</b>        |
| Threonine                    | 2000                           |
| Valine                       | 2100                           |
| Isoleucine                   | 2100                           |

|               |      |
|---------------|------|
| Leucine       | 2400 |
| Phenylalanine | 1400 |
| Lysine        | 2100 |
| Methionine    | 1100 |
| Tryptophan    | 250  |

### Summary of the invention

[006] The present invention is a nutrition bar allowing to utilize date seeds which are considered as waste product of date harvesting and challenging for humans to digest, and at the same time providing edible nutrient dense bar that is able to provide daily nutrition intake. The present invention is a nutrient dense bar comprising 60%wt to 70%wt of pitted dates, 30%wt to 35%wt of dried camel or Bovine milk powder, 0.6%wt to 1.3%wt of dehydrated date seed powder, 0.4%wt to 1%wt of salt, and 0.15%wt to 0.45%wt of multivitamin and multimineral composition. The multivitamin and multimineral composition comprises Vitamin A, Vitamin C, Vitamin E, Vitamin D, Vitamin K, Vitamin B1, Vitamin B2, Vitamin B3, Vitamin B5, Vitamin B6, Vitamin B7, Vitamin B9, Vitamin B12, Sodium, Calcium, Iron, Potassium, Phosphorus, Iodine, Magnesium, Zinc, Selenium, Copper, Manganese, Chromium, Molybdenum, Chloride and Choline.

[007] Dates are composed of primarily sugars, specifically glucose and fructose. These sugars make up nearly 70 to 80% of the date mass. The ratio of these simple sugars is approximately 1:1 in most date cultivars, exception for Labanah which contains a higher proportion of glucose to fructose. This makes dates an excellent source of fermentable substrates for simple microorganisms, such as edible yeasts, molds, and other microbes as a source of protein and other nutrients. Additionally, the high sugar content is favourable to formulate the food product as a quick source of energy, binder, and preservative, as many molds, yeasts, and bacteria cannot consume high concentrations of sugars. Dates contain a significant amount of potassium, magnesium, and calcium, with trace amounts of phosphorus and sodium. Protein and fat content in date flesh is too low to be considered of any nutritional relevance.

[008] Date seeds are considered a waste product of date harvesting. However, they make up 10 to 15% of the weight of dates and contain exceptional nutrition that is, unfortunately, challenging for humans to digest. They contain a high amount of dietary fiber and valuable bioactive compounds that could be used to improve the nutritional composition of the food

prototype. Date seeds are made up of between 20 to 80% dietary fiber, which can be used as a rich substrate for the production of other protein-rich ingredients using fermentation to enrich the overall protein yield of the date material. Approximately 53% of that fiber is insoluble fibers hemicellulose, cellulose, and lignin. This dietary fiber can also be included directly in the food product. The date seed is also a rich source of sodium, potassium and magnesium, with trace levels of phosphorus, selenium, calcium, iron, manganese, zinc, copper, nickel, cobalt, lead, and cadmium. One of the important components of date seeds is the protein content, which is higher than that of the date flesh. Making up approximately 5% of the total weight of the seed, the protein is composed of a moderate amount of essential amino acids methionine and lysine, as well as the semi-essential amino acid cysteine. However, date seeds are limited in their tryptophan content. Another source of protein is needed to make up the natural nutritional limitations of date seeds. The oil content is also higher in the seeds than in the date flesh, at approximately 10% of the mass. The oils of date seeds are composed of primarily oleic acid, lauric acid, followed by myristic and palmitic acid. There is a very minute quantity of linoleic acid and arachidonic acid. Date seeds also contain a high level of phenolic compounds (3102-4430 mg/100 g), which help improve gastrointestinal digestion, reduce inflammation, and increase the diversity of the microbiome over time.

[009] The following varieties of date seeds have been found to contain these nutritional elements (see table 2):

Table 2

Date Seed Varietals and Nutritional Composition

| Varietal         | Moisture (%) | Fat (%) | Protein (%) | Ash (%) | Carbohydrates (%) |
|------------------|--------------|---------|-------------|---------|-------------------|
| Fard             | 10.3         | 9.9     | 5.7         | 1.4     | 72.7              |
| Khalas           | 7.1          | 13.2    | 6.0         | 1.8     | 71.9              |
| Lulu             | 9.9          | 10.5    | 5.2         | 1.0     | 73.4              |
| Allig            | 0.04         | 12.67   | 5.17        | 1.12    | 81.0              |
| Deglet Nour      | 0            | 10.19   | 5.56        | 1.15    | 83.1              |
| Khalti           | 6.88         | 8.33    | 5.31        | 1.0     | 78.48             |
| Ruzeiz           | 5.4          | 10.2    | 6.8         | 1.1     | 61.5              |
| Sifri            | 5            | 10.4    | 6.5         | 1.1     | 58.5              |
| Kabkab & Shahani | 10.5         | 12.59   | 5.56        | 1.35    | 80.65             |
| Rajshahi         | 5-10         | 7-10    | 13          | 1-2     | 55-65             |
| Mabseeli         | 3.14         | 5.02    | 3.92        | 1.03    | 86.89             |
| Um-sellah        | 4.4          | 5.9     | 5.4         | 1.16    | 83.14             |
| Shahal           | 5.19         | 5.09    | 2.29        | 0.89    | 86.54             |
|                  |              |         |             |         |                   |
| Average          | 5.8          | 9.4     | 5.3         | 1.2     | 76.5              |

[010] Depending on the type of camel, the region it's from, and the diet of the animal, camel milk can range in the following nutritional composition – 0.28 to 6.40% fat matter, 2.15 to 4.90% total proteins, and 2.4 to 5.8% lactose, for a total of 8 to 15% dry matter. Freeze-drying camel milk increases the dry matter mass to the following composition – 26.13% protein, 25.6% fat, and 36.6% lactose. The remainder is 7.2% ash and minerals, as well as some moisture. The protein fraction is primarily casein, which makes up 21% of the total freeze-dried mass. The remainder is whey protein, making up 5% of the powder mass. The amino acid composition is complete with all nine essential amino acids. Major amino acids include glutamic acid, aspartic acid, leucine, isoleucine, lysine, and proline. Major minerals include calcium, magnesium, phosphorus, potassium, and sodium. Trace minerals include zinc, iron, manganese, and copper. Freeze-dried camels milk also contains vitamins A, C, B1, B2, B3, B5, B6, B9, B12, D, and E.

[011] It is also preferred that the nutrient dense bar comprising 63%wt to 67%wt of pitted dates, 30%wt to 35%wt of dried camel or Bovine milk powder, 0.7%wt to 0.9%wt of dehydrated date seed powder, 0.4%wt to 1%wt of salt, and 0.25%wt to 0.35%wt of multivitamin and multimineral composition as mentioned in previous paragraph.

[012] Another aspect of the present invention is a method of manufacturing a nutrient dense bar comprising pitted dates, dried camel or Bovine milk powder, dehydrated date seed powder, salt, and multivitamin and multimineral composition.

[013] The method of manufacturing a nutrient dense bar comprises the following steps:

- providing pitted dates, dried camel or Bovine milk powder, dehydrated date seeds, salt and a multivitamin and multimineral composition in the form of a tablet;
- grounding multivitamin and multimineral composition tablet into a fine powder and date seeds into a fine powder;
- mixing the powdered multivitamin and multimineral composition and powdered date seeds with the salt and dried camel or Bovine Milk powder;
- blending of pitted dates until the pitted dates take on a creamy consistency;
- addition of the mix of the powdered multivitamin composition, powdered date seeds, salt and dried camel or Bovine Milk powder to the blended pitted dates;

- blending the mixture obtained in a previous step until the mixture is homogenized in a paste; and
- baking the paste in oven to about 175 degrees Celsius and for about 10 minutes.

[014] Added multivitamin and multimineral composition comprises Vitamin A, Vitamin C, Vitamin E, Vitamin D, Vitamin K, Vitamin B1, Vitamin B2, Vitamin B3, Vitamin B5, Vitamin B6, Vitamin B7, Vitamin B9, Vitamin B12, Sodium, Calcium, Iron, Potassium, Phosphorus, Iodine, Magnesium, Zinc, Selenium, Copper, Manganese, Chromium, Molybdenum, Chloride and Choline.

[015] In addition the step of baking the paste may comprise the following substeps:

- preheating the oven to about 175 degrees Celsius;
- placing an aluminium baking sheet on a cooking pan;
- placing a piece of parchment paper on the aluminium baking sheet;
- placing of the paste on the piece of parchment paper and forming the paste on the piece of parchment paper in a sheet like shape;
- placing the cooking pan in the oven and baking for about 10 minutes; and
- removing the cooking pan from the oven to allow the paste to cool.

[016] Another surprising advantage of the present invention is a minimal necessity or no necessity to use additional water supply for a nutrition bar and its manufacture. The pitted dates already have sufficient amount of water. This feature is even more crucial in regions where reach to drinkable water is limited. In some circumstances, especially during mixing of ingredients, there can be a necessity to add the water.

[017] The term "comprising" is meant not to be limiting to any subsequently stated elements but rather to encompass non-specified elements of major or minor functional importance. In other words, the listed steps, elements or options need not be exhaustive. Whenever the words "including" or "having" are used, these terms are meant to be equivalent to "comprising" as defined above.

[018] Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material or conditions of reaction, physical properties of materials and/or use are to be understood as modified by the

word "about." All amounts are by weight, based on the total weight of the relevant product, unless otherwise specified.

[019] Unless stated otherwise or required by context, the terms "nutritional bar(s)" and "nutrition bar(s)" are used interchangeably herein.

[020] Unless stated otherwise, all percentages are by weight based on the total weight of the composition.

[021] For a more complete explanation of the above and other features and advantages of the invention, reference should be made to the following description of the preferred embodiments. The preferred embodiments apply to all aspects of the invention and can be used as appropriate for each aspect.

Table 3

Example of nutrition value for a nutrient bar having 330 g of pitted dates as a base.

| Essential Nutrients    |                            |            |                         |            |                                |            |                |
|------------------------|----------------------------|------------|-------------------------|------------|--------------------------------|------------|----------------|
|                        |                            | Amount (g) |                         | Amount (g) |                                | Amount (g) | Total          |
| <i>Macro-nutrients</i> | pitted dates (g Per 100 g) | 330        | Date Seed (g Per 100 g) | 4.2        | Dried Camel Milk (g Per 100 g) | 170        | (g Per 100 g)  |
| Water                  | 20.2                       | 66.66      | 5.8                     | 0.2436     | 3.3                            | 5.7        | 72.6           |
| Carbo-hydrates         | 68.2                       | 225.06     | 3.4                     | 0.1428     | 36.6                           | 62.2       | 287.4          |
| Protein                | 3.06                       | 10.098     | 5.3                     | 0.2226     | 26.1                           | 44.4       | 54.7           |
| Fat                    | 0.42                       | 1.386      | 9.4                     | 0.3948     | 25.6                           | 43.6       | 45.4           |
| Fiber                  | 8.16                       | 26.928     | 73.1                    | 3.0702     | 0,0                            | 0.0        | 30.0           |
| Total                  | 100.04                     | 330.132    | 97                      | 4.074      | 91.7                           | 155.8      |                |
| <i>Vitamins</i>        | (mg Per 100 g)             |            | (mg Per 100 g)          |            | (mg Per 100 g)                 |            | (mg Per 100 g) |
| Vitamin A              | 0                          | 0          | 0                       | 0          | 0.031                          | 0.1        | 0.1            |
| Vitamin C              | 0                          | 0          | 0                       | 0          | 3.0                            | 5.1        | 5.1            |
| Vitamin E              | 0                          | 0          | 0                       | 0          | 0                              | 0.0        | 0.0            |
| Vitamin D              | 0                          | 0          | 0                       | 0          | 0                              | 0.0        | 0.0            |
| Vitamin K              | 0                          | 0          | 0                       | 0          | 0                              | 0.0        | 0.0            |



|                    |                       |        |                       |          |                       |         |                       |
|--------------------|-----------------------|--------|-----------------------|----------|-----------------------|---------|-----------------------|
| Vitamin B1         | 0                     | 0      | 0                     | 0        | 0.0471                | 0.1     | 0.0                   |
| Vitamin B2         | 0                     | 0      | 0                     | 0        | 0.2                   | 0.3     | 0.0                   |
| Vitamin B3         | 0                     | 0      | 0                     | 0        | 0.4                   | 0.7     | 0,7                   |
| Vitamin B5         | 0                     | 0      | 0                     | 0        | 0.1                   | 0.1     | 0,1                   |
| Vitamin B6         | 0.2                   | 0.66   | 0                     | 0        | 0.1                   | 0.1     | 0,8                   |
| Vitamin B7         | 0                     | 0      | 0                     | 0        | 0                     | 0.0     | 0.0                   |
| Vitamin B9         | 0                     | 0      | 0                     | 0        | 0                     | 0.0     | 0.0                   |
| Vitamin B12        | 0                     | 0      | 0                     | 0        | 0                     | 0.0     | 0.0                   |
|                    |                       |        |                       |          |                       |         |                       |
| <b>Minerals</b>    | <b>(mg Per 100 g)</b> |        | <b>(mg Per 100 g)</b> |          | <b>(mg Per 100 g)</b> |         | <b>(mg Per 100 g)</b> |
| Sodium             | 7,5                   | 24,75  | 23,8                  | 0,9996   | 70,5                  | 119,9   | 145,6                 |
| Calcium            | 153                   | 504,9  | 9,5                   | 0,399    | 136,0                 | 231,2   | 736,5                 |
| Iron               | 0                     | 0      | 4,5                   | 0,189    | 0,7                   | 1,2     | 1,4                   |
| Potassium          | 425                   | 1402,5 | 486                   | 20,412   | 127,3                 | 216,4   | 1639,3                |
| Phosphorus         | 18,3                  | 60,39  | 0                     | 0        | 91,5                  | 155,6   | 215,9                 |
| Iodine             | 0                     | 0      | 0                     | 0        | 0.0                   | 0.0     | 0.0                   |
| Magnesium          | 91,5                  | 301,95 | 65,5                  | 2,751    | 13,2                  | 22,5    | 327,2                 |
| Zinc               | 0                     | 0      | 1,22                  | 0,05124  | 1,0                   | 1,6     | 1,7                   |
| Selenium           | 0                     | 0      | 0                     | 0        | 0,0                   | 0,0     | 0,0                   |
| Copper             | 0                     | 0      | 0,524                 | 0,022008 | 0,2                   | 0,3     | 0,3                   |
| Manganese          | 0                     | 0      | 1,48                  | 0,06216  | 0,2                   | 0,4     | 0,4                   |
| Chromium           | 0                     | 0      | 0                     | 0        | 0.0                   | 0.0     | 0.0                   |
| Molybdenum         | 0                     | 0      | 0                     | 0        | 0.0                   | 0.0     | 0.0                   |
| Chloride           | 0                     | 0      | 0                     | 0        | 0.0                   | 0.0     | 0.0                   |
| Choline            | 0                     | 0      | 0                     | 0        | 0.0                   | 0.0     | 0.0                   |
|                    |                       |        |                       |          |                       |         |                       |
| <b>Amino Acids</b> | <b>(mg Per 100 g)</b> |        | <b>(mg Per 100 g)</b> |          | <b>(mg Per 100 g)</b> |         | <b>(mg Per 100 g)</b> |
| Threonine          | 53                    | 174,9  | 14                    | 0,588    | 6900,0                | 11730,0 | 11905,5               |
| Valine             | 65                    | 214,5  | 24                    | 1,008    | 7700,0                | 13090,0 | 13305,5               |
| Isoleucine         | 44                    | 145,2  | 13                    | 0,546    | 8230,0                | 13991,0 | 14136,7               |
| Leucine            | 82                    | 270,6  | 30                    | 1,26     | 10130,0               | 17221,0 | 17492,9               |
| Phenylalanine      | 48                    | 158,4  | 19                    | 0,798    | 7000,0                | 11900,0 | 12059,2               |
| Lysine             | 60                    | 198    | 26                    | 1,092    | 8300,0                | 14110,0 | 14309,1               |
| Methionine         | 21                    | 69,3   | 6                     | 0,252    | 5100,0                | 8670,0  | 8739,6                |
| Tryptophan         | 34                    | 112,2  | 0                     | 0        | 1200,0                | 2040,0  | 2152,2                |

[022] In one embodiment of the present invention the nutrition bars having two day nutrition requirement are prepared as follows. Starting materials are pitted dates – 660 g, date seeds – 8.4 g, dried camel milk powder – 340 g, salt – 6 g, two multivitamin tablets. The multivitamin tablets are Centrum Adult Multivitamin/Multimineral Supplement with Antioxidants, Zinc,

Vitamin D3 and B Vitamins manufactured by GlaxoSmithKline. Necessary equipment for making a nutrition bar is as follows: laboratory scale with resolution of 0.01 g; mortar; pestle; high-speed blender; baking oven; aluminium baking sheet and parchment paper. Making procedure or instructions are as follows:

1. ground the multivitamin tablet into a fine powder using the mortar and pestle;
2. ground the date seeds into a powder using the high-speed blender;
3. combine the powdered multivitamin and powdered date seeds with the salt and the dried milk powder and set aside;
4. add the pitted dates to the blender and blend until the dates take on a creamy consistency, approximately 1 min;
5. add previously prepared powders to the blended pitted date cream and continue to blend until the mixture is homogenized, about another 1 min;
6. pre-heat the oven to 175 degrees Celsius;
7. place a piece of parchment paper over the aluminium baking sheet;
8. scrape out the mixed and blended paste material and place it on the parchment paper. Press the paste material into the sheet with a metal spoon until it forms a sheet of material;
9. if the paste material does not stick well together, add water in 25 mL increments and blend, until the paste material sticks;
10. place the sheet pan in the oven and bake for 10 minutes;
11. remove the paste material from the oven and allow it to cool;
12. slice the baked material into 10 sections to form 10 bars. 5 bars are sufficient to feed one human for 1 day and meet human's daily nutritional requirements.

[023] Flavourings are preferably added to the nutrition bar in amounts that will impart a mild, pleasant flavour. The flavouring may be any of the commercial flavours typically employed in nutrition bars, such as varying types of cocoa, pure vanilla or artificial flavour, such as vanillin, ethyl vanillin, chocolate, malt, mint, yogurt powder, extracts, spices, such as cinnamon, nutmeg and ginger, mixtures thereof, and the like. The nutrition bars are flavoured to taste and suitable amounts of each flavouring agent desired will therefore be included. Flavourings which mask off-tastes from vitamins and/or minerals and other ingredients are preferably included in the products of the invention.

[024] While the invention may be susceptible to various modifications and alternative forms, where some embodiments of the invention have been shown in the figures, it should be

understood that the invention is not intended to be limited to the particular forms disclosed. Rather, the invention includes all modifications, equivalents, and alternatives falling within the scope of the invention as defined by the following claims.

## CLAIMS

1. A nutrient dense bar comprising:
  - 60%wt to 70%wt of pitted dates,
  - 30%wt to 35%wt of dried camel or Bovine milk powder,
  - 0.6%wt to 1.3%wt of dehydrated date seed powder,
  - 0.4%wt to 1%wt of salt, and
  - 0.15%wt to 0.45%wt of multivitamin and multimineral composition,wherein the multivitamin and multimineral composition comprises Vitamin A, Vitamin C, Vitamin E, Vitamin D, Vitamin K, Vitamin B1, Vitamin B2, Vitamin B3, Vitamin B5, Vitamin B6, Vitamin B7, Vitamin B9, Vitamin B12, Sodium, Calcium, Iron, Potassium, Phosphorus, Iodine, Magnesium, Zinc, Selenium, Copper, Manganese, Chromium, Molybdenum, Chloride and Choline.
2. The nutrient dense bar according to Claim 1, comprising 63%wt to 67%wt of pitted dates.
3. The nutrient dense bar according to Claim 1 or 2, comprising 0.7%wt to 0.9%wt of dehydrated date seed powder.
4. The nutrient dense bar according to any one of the preceding claims, comprising 0.25%wt to 0.35%wt of multivitamin and multimineral composition.
5. A method of manufacturing of a nutrient dense bar, wherein the method comprises the following steps:
  - providing pitted dates, dried camel or Bovine milk powder, dehydrated date seeds, salt and a multivitamin and multimineral composition in the form of a tablet;
  - grounding multivitamin and multimineral composition tablet into a fine powder and date seeds into a fine powder;
  - mixing the powdered multivitamin and multimineral composition and powdered date seeds with the salt and dried camel or Bovine Milk powder;
  - blending of pitted dates until the pitted dates take on a creamy consistency;
  - addition of the mix of the powdered multivitamin composition, powdered date seeds, salt and dried camel or Bovine Milk powder to the blended pitted dates;

- blending the mixture obtained in a previous step until the mixture is homogenized in a paste;
  - baking the paste in oven to about 175 degrees Celsius and for about 10 minutes.
6. The method according to Claim 5, wherein the step of baking the paste comprises the following substeps:
- preheating the oven to about 175 degrees Celsius;
  - placing an aluminium baking sheet on a cooking pan;
  - placing a piece of parchment paper of the aluminium baking sheet;
  - placing of the paste on the piece of parchment paper and forming the paste on the piece of parchment paper in a sheet like shape;
  - placing the cooking pan in the oven and baking for about 10 minutes; and
  - removing the cooking pan from the oven to allow the paste to cool.
7. The method according to Claim 5 or 6, wherein in the mixing step a water is added.
8. The method according to any one of the preceding claims, wherein provided multivitamin and multimineral composition comprises Vitamin A, Vitamin C, Vitamin E, Vitamin D, Vitamin K, Vitamin B1, Vitamin B2, Vitamin B3, Vitamin B5, Vitamin B6, Vitamin B7, Vitamin B9, Vitamin B12, Sodium, Calcium, Iron, Potassium, Phosphorus, Iodine, Magnesium, Zinc, Selenium, Copper, Manganese, Chromium, Molybdenum, Chloride and Choline.

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IB 2022/059035

| <b>A. CLASSIFICATION OF SUBJECT MATTER</b><br>IPC: <b>A61K 36/889</b> (2006.01); <b>A23P 10/28</b> (2016.01)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                |
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| According to International Patent Classification (IPC) or to both national classification and IPC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                |
| <b>B. FIELDS SEARCHED</b><br>Minimum documentation searched (classification system followed by classification symbols)<br><b>A61K, A23P</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                |
| Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                |
| Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)<br><b>TXTE, epodoc, fsta</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                |
| <b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                |
| Category*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                                                                                                                                            | Relevant to claim No.                                                          |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Al-Okbi S.Y., "Date Palm as Source of Nutraceuticals for Health Promotion: a Review", Current Nutrition Reports (2022), Vol. 11, No. 4, pages 574-591, 20 September 2022 [online], [retrieved on 2023-05-17], retrieved from the Internet, < <a href="https://link.springer.com/article/10.1007/s13668-022-022-00437-w">https://link.springer.com/article/10.1007/s13668-022-022-00437-w</a> > whole document | 1-8                                                                            |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Mrabet Abdessalem et al., "Date Palm Fruits as a Potential Source of Functional Dietary Fiber: A Review", Food Science and Technology Research, Vol.25, No. 1, pages 1-10, 2019, [retrieved on 2023-05-23], retrieved from the Internet < <a href="https://www.jstage.jst.go.jp/article/fstr/25/1/25_1/_article">https://www.jstage.jst.go.jp/article/fstr/25/1/25_1/_article</a> > whole document            | 1-8                                                                            |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Al-Farsi M. A. et al., "Nutritional and functional properties of dates: a review", Critical Reviews in Food Science and Nutrition, Vol. 48, No. 10, pages 877-887, 23 October 2008 [online] [retrieved on 2023-05-23] retrieved from the Internet <a href="https://www.tandfonline.com/doi/abs/10.1080/10408390701724264">https://www.tandfonline.com/doi/abs/10.1080/10408390701724264</a> abstract          | 1-8                                                                            |
| Further documents are listed in the continuation of Box C.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                               | <input checked="" type="checkbox"/> See patent family annex.                   |
| * Special categories of cited documents:<br>"A" document defining the general state of the art which is not considered to be of particular relevance<br>"E" earlier application or patent but published on or after the international filing date<br>"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)<br>"O" document referring to an oral disclosure, use, exhibition or other means<br>"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<br>"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<br>"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<br>"&" document member of the same patent family |                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                |
| Date of the actual completion of the international search<br>22 May 2023 (22.05.2023)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                               | Date of mailing of the international search report<br>26 May 2023 (26.05.2023) |
| Name and mailing address of the ISA/AT<br>Austrian Patent Office<br>Dresdner Straße 87, A-1200 Vienna<br>Telephone No. +43 (1) 53424 342                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                               | Authorized officer<br>Krenn Maria<br>Telephone No. +43 1 534 24 435            |