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# NUTRACEUTICAL MULTIGRAIN LACTOBACILLUS FORMULATION WITH ITS MOISTURE CONTENT ESTIMATION

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## ABSTRACT

Nutrients that are generally present at relatively low concentrations in living tissues and which are needed for optimum performance of a particular function in the living system are designated as 'Micronutrients'1-3. They include vitamins and minerals. Micronutrients, although do not provide energy themselves unlike macronutrients (carbohydrate, fat and protein), but help in the liberation and utilization of energy from the macronutrients. In addition, they have other specific vital functions in the body. Vitamins are essential for the utilization of the macronutrients and also in the regulation of the body processes – metabolism and circulation, digestion and absorption of nutrients and reproduction. Macrominerals such as calcium and phosphorous are structural components of bones and skeleton; sodium and potassium are elements present in cellular fluids; magnesium is an active constituent of many enzyme systems

**Keywords*:*** - Nutraceutical, Lactobacillus, millet, formulation.

**INTRODUCTION:**

Nutrients that are generally present at relatively low concentrations in living tissues and which are needed for optimum performance of a particular function in the living system are designated as 'Micronutrients'[1-3]. They include vitamins and minerals. Micronutrients, although do not provide energy themselves unlike macronutrients (carbohydrate, fat and protein), but help in the liberation and utilization of energy from the macronutrients. In addition, they have other specific vital functions in the body. Vitamins are essential for the utilization of the macronutrients and also in the regulation of the body processes – metabolism and circulation, digestion and absorption of nutrients and reproduction. Macrominerals such as calcium and phosphorous are structural components of bones and skeleton; sodium and potassium are elements present in cellular fluids; magnesium is an active constituent of many enzyme systems[4-7]. Among the microminerals, iron is an essential component of red blood cells; zinc, molybdenum, copper and manganese activate a number of enzyme systems essential for diverse body functions; iodine is a part of the hormone thyroxine. Other trace elements either essential or beneficial to mammalian and avian species include: arsenic, boron, chromium, cobalt, fluorine, nickel, selenium, silicon and vanadium. Trace elements exist in two forms- as charged ions or bound to proteins (e.g., Metalloenzymes)

The aim of achievement of maximal state of well-being is alarmingly increased with the introduction of nutraceuticals. The term nutraceuticals, itself is a wide class which include many categories and subcategories under it. The contribution of nutraceuticals to the public health is one of the most concerned approaches in health-care system. Although the system claims to have advanced techniques to treat the diseases, still the nutraceutical approach counts because of the power it holds to treat diseases through diet. For a better explanation of comparison, pharmaceuticals include drugs for the treatment of diseases, but nutraceuticals are proposed to prevent diseases[8-9]. There are some dietary supplements also which enhances the diet containing vitamins, minerals or concentrate, and metabolite or extract. All these categorized food products, plants and sources are thus very imperative to be recognized as these possess nutritional and medicinal properties. In recent years, the diet and lifestyle related disorders have become a major issue for the health care. The increased attention and awareness among the subjects for health care along with the availability of sophisticated methodology for determination of the nutritional level of diet is worth studying. It can be reviewed from various studies that nutraceuticals provide non-specific biological therapy for

treatment and prophylaxis of various diseases. To understand the applications, the nutraceuticals are needed to be classified. The classification into various classes depending on their uses is:

a. Traditional nutraceuticals, b. Nontraditional nutraceuticals, c. Fortified nutraceuticals , d. Recombinant nutraceuticals, e. Potential and established nutraceuticals, f. Phytochemicals, g. Herbals, h. Functional foods, i. Dietary supplements and dietary fibers and j. Probiotics and prebiotics[10-15].

Probiotics plays an important role in solving many the health issues by conferring antioxidamt and immunity booster activity. If the multigrain formulations are prepared then it will serve as ideal formulation and good prophylactic agent.

On the same grounds the *Lactobacillus plantarum*, pearl millet (*Pennisetun glacum*), *sorghum (Sorghum bicolor)* and and sugar were obtained from the local market. The millets and other ingredients were prepared for formulation by cleaning and storing at room temperature in plastic containers. Six formulations were prepared by taking different concentration of probiotics from range 2 to 20 colony forming unit/ ml in multigrain system.

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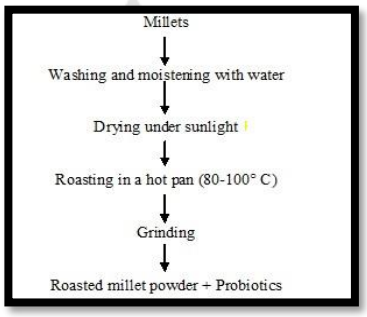


**Fig.1. Preparation of probiotics nutraceutical formulation**

Later, the moisture content in nutraceutical powder mix product was determined by gravimetric method as per the procedure outlined in IS: SP-18 (1981)[16-18].

About 5 g of the sample was accurately weighed in a previously dried and weighed flat bottomed aluminum dish (7-8 cm in diameter). The dish was then heated in an electric oven maintained at 102 ±1ºC for about 2 hr. The dishes were cooled in desiccator and weighed. The process of drying, cooling and weighing was repeated at 30 min interval until the difference between two consecutive weighing was less than 1 mg. The lowest weight obtained in the last weighing was recorded.

$$\text{Moisture, per cent by weight} = \frac{100\ (W_1\text{-}W_2)}{W_1\text{-}W}$$

Where,

W= weight in g of the empty dish,; $W_1$= weight in g of the dish with the material before drying and $W_2$= weight in g of the dish with the material after drying.

Where,

W= weight of beaker; $W_1$= weight of sample taken; $W_2$= weight of beaker + residue after drying

The preliminary investigation showed that the moisture content in the formulation prepared were as follows.

**Table. No.1. Multigrain formulation including probiotics with moisture content**

| Formulation no. | Percentage of probiotics used in CFU/ml | Moisture content. |
|---|---|---|
| 1. | 2 | 3.1±0.01 |
| 2. | 3 | 4.2±0.08 |
| 3. | 4 | 4.1±0.08 |
| 4. | 5 | 5.2±0.07 |
| **5.** | **10** | **2.4±0.02** |
| 6. | 20 | 8.0±0.05 |

CFU/ML- colony forming unit/ ml, [Results were analysed by one-way ANOVA using Dunnett's multiple comparison test; Significance at **p<0.01.

The formulation of multigrain with 10 % lactobacillus showed the lower percentage of moisture as compared to other formulation with different percentage of probiotics.

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