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DEVELOPMENT OF BOVINE COLOSTRUM POWDER FOR AUTISM CHILDREN IN THOOTHUKUDI

Dr.M.S. Rubha

M.Sc., M.Phil., Ph.D, Associate Professor,

In Food Science and Nutrition

Holy Cross Home Science College , Thoothukudi

ABSTRACT

The study aimed to develop Bovine Colostrum Milk powder for autism children to improve their immunity. Autism is a complex and clinically heterogeneous disorder with a spectrum of symptoms. Although autism affects primarily brain function (especially affect, social functioning, and cognition), it is unknown to what extent other organs and systems are disrupted. Bovine colostrum is a milky fluid that comes from the breasts of cows the first few days after giving birth, before true milk appears. It contains proteins, calcium, vitamins and minerals. Antibody levels in bovine colostrum can be 100 times higher than levels in regular cow's milk. Since the bovine colostrum is also loaded with nutrients that promote growth, it boosts immunity, treats infections and offer more benefits for humans especially for autism children. The sample is prepared by boiling the Bovine Colostrum milk and drying it at sunlight for 5-6 hours. The dried sample is then made into fine powder, it is then added with sugar powder, cocoa powder and cardamom powder to enhance the flavor. The sensory evaluation was done using a 5 point hedonic scale with the help of seven experts and the results were computed accordingly. The microbial analysis was carried out and absence of fungi, yeast and moulds were noted. The Nutritive analysis was carried out for calories, carbohydrates, protein, calcium, iron, zinc and fat. These nutrients are present in high amounts whereas microbial count of yeast and moulds were absent. Bovine Colostrum powder was popularized to the autism children's parents at Thoothukudi.

Keywords : Bovine colostrum Powder, Probiotics, Autism children

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INTRODUCTION

Autism is a complex and clinically heterogeneous disorder with a spectrum of symptoms. Although autism affects primarily brain function (especially affect, social functioning, and cognition), it is unknown to what extent other organs and systems are disrupted. (Kercood, 2014)

Brain specimens from autism children exhibit signs of active, ongoing inflammation, as well as alterations in gene pathways associated with immune signaling and immune function. Autism may in fact be a systemic disorder with connections to abnormal immune responses. Such immune system dysfunction may represent novel targets for treatment. A better understanding of the involvement of the immune response in autism, and early brain development is altered, may have important therapeutic implications.(Milo Carega, 2010), The probiotics play an essential role in boosting the immunity by destroying the harmful microbes in humans. (Fijan, 2019) Probiotics also enhance immunity beyond the GI tract through interactions with the common mucosal immune system (CMIS).

The probiotic obtained from bovine colostrum is rich in macro and micro nutrients as well as antibodies like immunoglobins which fight against antigens. Since the bovine colostrum is also loaded with nutrients that promote growth, it boosts immunity, treats infections and offer more benefits for humans especially for autism children. (Dzik 2017)

Bovine colostrum is a milky fluid that comes from the breasts of cows the first few days after giving birth, before true milk appears. It contains proteins, calcium, vitamins and minerals. Antibody levels in bovine colostrum can be 100 times higher than levels in regular cow's milk.

Hence the development of probiotic foods using bovine colostrum will improve the health of autism children. As autism is a serious developmental disorder that impairs the ability to communicate and interact. The impairment is mainly due to decreased immune level and other nutrients, thus the investigator designed the study on “The Development of Probiotic Foods using Bovine Colostrum Powder for Autism children in Thoothukudi”. The following objectives are carried out.

OBJECTIVES:

- To develop and formulate the Bovine Colostrum powder.
- To find out the keeping quality of developed Bovine Colostrum powder.

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- To analyze the nutrients in developed Bovine Colostrum powder.
- To analyze the microbial content of the Bovine Colostrum powder.
- To popularize and provide the product to the autism children.

METHODOLOGY

The raw material Bovine Colostrum milk was collected from Kootampuli Dairy farm, in Thoothukudi district. It was kept in a clean vessel to boil at 100.5^{o}C. Vanilla essence was added to enhance the flavour and the milk curls were removed separately, kept in direct sunlight for drying. The dried bovine colostrum was blended in a mixer, along with cardamom which enriches the aroma. Cocoa powder was added to develop chocolate flavor. For the above prepared samples (S_A, S_B, S_C) were evaluated by five panel members for sensory characteristics using 5- hedonic ranking scale ranging from ‘’like to dislike ”. The developed Bovine Colostrum Powder was subjected to nutrient analysis. The energy (calories), carbohydrates, protein, calcium, iron, zinc and fat were determined using protocols antibody levels in bovine colostrum can be 100 times higher than levels in regular cow's milk. The prepared probiotic powder was analyzed for microbial estimation using the standard methods at the interval of 15 to 30 days. Bacteria such as *E,coli* and *Salmonella typhi* were analyzed.Total Plate Count (TPC), including yeast and mold count were analyzed. The developed powered was distributed to the autism children at the age of 8-15 years.

Result and Discussion

Organoleptic evaluation of the Bovine Colostrum powder

Table 1

Score card of the Bovine Colostrum Powder

Samples	Appearance/ Colour (%)	Taste / Flavour (%)	Smell/ Odour (%)	Texture/ Mouth feel (%)	Overall acceptability (%)
Sample-I	90	80	79	85	82
Sample-II	95	90	85	89	90
Sample-III	96	95	90	96	96

Table 1 described that sample III(100g Bovine Colostrum milk powder and 15g Cocoa powder) got the highest score about 96 percent sample III was highly accepted than sample I and

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Sample II. The scores were observed by the appearance, taste, smell, texture and overall acceptability. The Sample- II had a better acceptability score about 95 percent appearance, 90 percent taste, 85 percent smell and 89 percent texture. The sensory characteristics of Bovine Colostrum Milk powder were studied by organoleptic evaluation. It revealed that the Bovine Colostrum milk powder was highly accepted by the panel members.

Shelf life study of the Bovine Colostrum powder

Table 2 explained that Bovine Colostrum powder Sample-I was not changed in the appearance, taste, flavor, smell and texture in 15th day. In 30th day. In 45th day the appearance was slightly changed sample II there was no changes was observed and till 30th day. The colour was not changed in the 30th day, but there was slight change in the colour in 45th day. Sample III there was no change in the appearance, taste, flavor, smell and texture in 15th day to 30th day only there was slight change in colour 45th day.

Microbial analysis of the Bovine Colostrum powder

The prepared Bovine Colostrum powder was stored in container at room temperature for a period of 45 days and the microbial analysis was done during initial 15 days, 30 days, and 45 days of storage. The packaging was placed visible and catalysis role in a modern economy and development of product according to the consumer preferences. It enables to preserve the quality and increases the shelf life of the Bovine Colostrum powder.

The developed Bovine Colostrum powder was analysed for microbial testing. On the initial day there was no change. In the 45th day of storage it was revealed that microbial content of the powder increased shelf life storage in container. It was understood that the growth of the bacteria is less when the Bovine Colostrum Milk powder was tightly closed in air tight container. No yeast and fungus was observed.

Table 2

Microbial analysis of the Bovine Colostrum powder

Parameter	Bovine Colostrum powder (Sample-I)
	Total count
Bacterial count	25cfu/gm
Fungal count	Absent
Yeast and Mould	Absent

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Table 2 shows that the bacterial count in Bovine Colostrum powder was contained within the standard limits of 25cfu/gm. Fungi was not seen in the Bovine Colostrum milk powder. The yeast and moulds were absent in the sample. The absence of fungi, yeast and moulds in the sample increases the shelf life of the sample.

Nutrient analysis of the Bovine Colostrum powder

Table 3

Nutrient analysis of the Bovine Colostrum powder

Nutrients	Nutritive value
Calories	441 kcal
Carbohydrates	63.8gm
Protein	19.5gm
Iron	11.3gm
Calcium	357mg
Zinc	15.6gm
Fat	12gm

Table 3 reveals that the Bovine Colostrum powder contains about 441kcal of Calories, 63.8g of Carbohydrates, 19.5g of Protein, 11.3g of Iron, 357mg of Calcium, 15.6g of Zinc and 12g of Fat. It was revealed that the sample was rich in calcium, calories and zinc.

Popularization of the Bovine Colostrum Powder

The developed Probiotic Bovine Colostrum Powder was popularized among the autistic children and parents in Alangarthitu. The acceptability of the powder was analyzed through demonstrations. The investigator created awareness about the immunity and nutritional importance of Bovine Colostrum Milk Powder among the parents and children. Pamphlet was distributed to the parents.

CONCLUSION

This study was highlights the essential role of Bovine Colostrum powder in boosting immunity for autism children. Autism children suffer from various immune disorders, the probiotic Bovine Colostrum powder has vast nutritive value. This study has confirmed the acceptability of Bovine Colostrum powder which was found to be convenient, nutritive and appealing to the respondents.

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There were several methods for producing Bovine Colostrum powder. Comparing new drying technologies with existing methods and their effect on bio active components of produced product would be an important subject for future research. Also, further studies, especially clinical trials are needed to be considered in order to confirm the health benefits of the Bovine Colostrum powder.

The vast amount of nutrients found in the Bovine Colostrum powder could be even consumed by persons recovering from illness to increase their immune health. The amount of calcium was found in satisfactory amount, which could reduce the problems of calcium deficiency in women. Protein deficiency also be treated by consuming Bovine Colostrum powder.

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