IMPACT OF HERBAL ADDITIVES ON LACTOSE STATUS OF MILK

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ABSTRACT

Different herbal additives like ginger, Coriander, coffee, tea were tested for their lactose reduction capacity in different brands of milk and milk products. Ginger and tea extracts were exhibited more lactose reduction activity. The results of this present study reveals that these herbal extracts seems to be involved in the lactose catabolism either directly ore indirect as co-factor for the activity of lactase enzyme, so they may be consumed along with milk products to avoid lactose intolerance. Among the tested milk brands, Arokya was found with higher quantity of lactose (65.7mg/l) and when its treated with ginger extract it was reduced in to 20mg/l.

Keywords: Lactose intolerance, herbal additives.

INTRODUCTION

 Lactose intolerance is the condition in which the deficiency of lactase essentially needed for the metabolism of lactose. The consequence of this disorder such as bloating, flatulence, stomach cramps and diarrhea. Lactose intolerance of most human races except northern Europeans and some Africans is due to the disappearance of most or all of the lactase activity of the intestinal cells after childhood, so that lactose can no longer be completely digested and absorbed. In persons with lactose intolerance the lactose remaining in the intestinal tract causes discomfort conditions such as diarrhea and formation of intestinal gases such as hydrogen.

These conditions are reversed by just restricting the lactose rich food to the patients. However, milk is one of the balanced diet which contains essential nutrients such as proteins, vitamins, minerals for the vital functions of the body. Hence the present investigation has been undertaken to find out the lactose status of dairy products and to evaluate the activity of herbal extract for the possible breakdown of the complex sugar i.e. lactose into smaller units so as to assist the process of digestion.

EXPERIMENTAL

In the preliminary analysis, different milk and milk products were tested for their lactose content separately using spectrophotometer at 540nm by following the methodology prescribed by Nickersan et al., (1976). From that a milk sample was chosen and mixed with the crude herbal extract such as ginger, tea, coffee, Coriander and lactose level was estimated. 8g/ml of sample was taken and 1ml of ZAPT (Zinc acetate phospho tungstic acid) was added with the sample. This mixture was made into 10ml with distilled water and the content was filtered after 10 minutes using Whatmann no.1 filter paper. With 0.5ml of the filtrate, 0.5ml of NaOH solution was added and diluted to 10ml with distilled water and the mixture was filtered. 5ml of this filtrate was diluted to 10ml using distilled water. 5ml of the above filtrate was mixed with 5ml

of glycine NaOH buffer, 0.5ml of methyl amine solution and 0.5ml of Sodium sulphite. The content was mixed thoroughly and heated in water bath at 65' C for 25 minutes and cooled in ice for 2 minutes to stop the reaction. Absorbance was read at 540nm using spectrophotometer. A standard curve was drawn by plotting absorbance against concentration of lactose and lactose level was determined separately for all samples.

Particulars	B	S1	S2	S3	S4	S5	T1	T2	T3	T4	T5	AD1	AD2	AD3	AD4
Volume of Working Standard (ml)	--	5.0	5.0	5.0	5.0	5.0	5.0 (flt)	5.0 (flt)	5.0 (flt)	5.0 (flt)	5.0 (flt)	5.0 (flt)	5.0 (flt)	5.0 (flt)	5.0 (flt)
Concentration of Working Standard (mg)	--	0.5	0.75	1.0	1.25	1.5	--	--	--	--	--	--	--	--	--
Volume of Buffer (ml)	--	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Volume of Methylamine solution (ml)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Volume of Sodium sulphite (ml)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Mix well and heat all the tubes in thermostatically controlled waterbath at 65' C for 25 minutes and cool immediately in icewater bath for 2 minutes to stop the reaction.															
Volume of distilled water (ml)	10.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Optical density at 540nm	0.000	0.12	.23	0.32	0.38	0.46	0.11	0.40	0.50	0.50	0.60	0.10	0.10	0.15	0.37
Lactose content (mg/l)							22.9	65.7	81.5	81.5	97.8	20.0	20.0	31.25	60.3

RESULTS AND DISCUSSION

Among the tested herbal additives, ginger and tea extracts were found to be more active towards the reduction of lactose content of Arokya milk from the initial level of 65.7mg/l to 20mg/l (Table.1) and followed by coffee extract (31.2mg/l). As described by Gekas and Lopes the hydrolysis of lactose could be prevented by processing of the milk and milk products including heating strategies. Most of the milk and milk products are coming to the market after such

treatments. Hence the probability of lactose catabolism will get deprived. Their observations were close standing with the results of the present study. Stephenson *et al.,* have analyzed the level of severity of abdominal disorders in accordance with the lactose level in blood. Severity was more frequent in lactose intolerant than in lactose tolerant ones after the consumption of large quantity of milk or milk products. The concentration of lactose in the treated milk samples might have been get reduced due to the secretion of higher quantity of lactase enzyme. For such a higher lactase production herbal additives could have played an indirect role to elevate the performance of the respective glands or cells.

CONCLUSION

It is concluded that the lactose content was well reduced in the commercial milk sample (Arokya) by adding the herbal additives such as ginger and tea extracts. The persons suffering from lactose intolerance are hence advised to take milk samples along with herbal additives thereby avoid the discomfort conditions arising due to lactose intolerance. Further research on this may lead to the discovery of a new more potent bioactive principle to suppress the lactose content in the milk thereby solving the permanent problem of lactose intolerance.

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> "There's so much pollution in the air now that if it weren't for our lungs there'd be no place to put it all."
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> *-Robert Orben*