



## DIVERSIFICATION IN FLAVOURED MILK: A REVIEW

PRAVEEN KUMAR TIWARI<sup>1</sup>, SHAKEEL ASGAR<sup>2</sup>

### AUTHOR DETAILS

Received: 2<sup>nd</sup> Feb 2017

Revised: 19<sup>th</sup> Feb 2017

Accepted: 24<sup>th</sup> Feb 2017

#### Author details:

<sup>1</sup>M.Tech Scholar, Department of Dairy Technology, College of Dairy Science and Food Technology, Raipur, (CG), India

<sup>2</sup>Assoc. Prof., Department of Dairy Technology, College of Dairy Science and Food Technology, Raipur, (CG), India

**Corresponding author: Praveen Kumar Tiwari**, Department of Dairy Technology, College of Dairy Science and Food Technology, Raipur, (CG), India

Email: [praveen.tiwari0611@gmail.com](mailto:praveen.tiwari0611@gmail.com)

### ABSTRACT

Plain milk is most consumed liquid product, but when this milk is converted to flavoured milk that will be more acceptable by the peoples of all age groups. Flavoured milk is the second largest widely consumed liquid dairy product after plain milk, having numerous nutritional as well as physiological benefits. It contains same essential 9 nutrients as the milk. Adding flavour and colour to milk increases its palatability value. Some natural as well as artificial flavours are used in the preparation of flavoured milk. Flavoured milks are also prepared by adding various types of herbs to provide therapeutic value to the flavoured milk. Several vitamins and minerals are also added in flavoured milk to enrich with health providing components. Fruit based flavoured milk are prepared by adding fruit pulps or fruit juices to add the variety to the flavoured milks.

**KEYWORDS:** Flavoured milk, chocolate flavoured milk, sterilized flavoured milk, herbal flavoured milk, fruit flavoured milk.

### INTRODUCTION

Plain milk is the largest consumed liquid dairy product all over the world due to its palatability, nutritious value and easy availability. If this milk is added with some ingredients like colour, flavour and sugar, this modified form is called flavoured milk and it is more acceptable by the peoples of all age groups from children to adolescence. Milk beverages of different flavours for direct consumption are common in India and other countries.

According to FSSAI, "Flavoured Milk, by whatever name called may contain nuts (whole, fragmented or ground) chocolate, coffee or any other edible flavour, edible food colours and cane sugar. Flavoured milk shall be pasteurized, sterilized or boiled. The type of milk shall be mentioned on the label."

Flavoured milk is a sweetened dairy drink with cow's or buffalo's milk by adding colourings, artificial or natural flavourings and sweetener that make more appetizing, especially to children. Flavoured milk is prepared by pasteurization, sterilization or ultra-high-temperature (UHT) treatment, which provides a longer shelf-life than plain milk. It contains the same 9 essential nutrients as in plain milk like calcium, potassium, phosphorus, protein, vitamin D, vitamin A, vitamin B<sub>12</sub>, riboflavin and niacin. Different types of

flavoured milks having several flavours including natural or synthetic flavours are available in the present day market such as chocolate, strawberry, pistachio, raspberry, vanilla etc., from whole to low-fat and fat-free varieties. Adding some sugar in flavoured milk may help to improve the appeal of nutritious foods.

Several scientific research's also supports the benefits of nutrient-rich flavoured milk as a part of a healthy diet. In general, people consuming flavoured milk are getting more amount of calcium, phosphorus, magnesium, potassium and vitamin A. <sup>[1]</sup> Flavoured milk drinkers have less total fat and calorie intakes than non-milk drinkers. Children's consuming plain or flavoured milk do not have a higher body mass index (BMI) than those who do not drink milk. <sup>[2]</sup> Many authorities are encouraging for milk consumption by children and science also supports the value of flavoured milk in children's diets. Flavoured milk is an excellent way to increase milk consumption among children and is a better way to help children to make their diets more nutritious. Studies showed that flavoured milk can help in closing the nutrition gap in children as they prefer it and will drink more milk when it's flavoured. Many health professional organization supports the

inclusion of low-fat or fat-free flavoured milk in the diets of children’s and adolescents.

Flavoured milk is the most appropriate food that fulfills the nutritional requirement of the peoples of every age. Malnutrition is a condition which is caused by the lack of essential nutrition. Children’s of poor families are not getting the proper amount of nutrition due to this they suffer from malnutrition. The data from World Bank showed that India has the world’s highest number of population that are affected from malnutrition. In the report of NFHS-3 data, 40.4 per cent peoples are underweight, 22.9% were wasted (low weight for their height) and 44.9 % were stunted (low in height for age). In order to fulfil the nutrition requirement, flavoured milk can be the best source. In India, various state governments have started the supply of flavoured milk to “anganwadis” and government schools to fulfil the need of nutrition in children’s diet.

**2. Varieties in flavoured milk**

Flavoured milk is milk to which some flavour has been added. Flavoured milks usually start with a pleasant flavour. When the term “milk” is used in the preparation of flavoured milk, it means the product should contain a milk fat percentage of that milk from which it was prepared. But when the fat level is lower (1-2 %) the term ‘drink’ is used. These types of milk beverages are prepared by standardizing dairy as well as non-dairy ingredients in appropriate concentration. An artificial flavour and colour is added in manufacturing of flavoured milks. Fat and SNF is adjusted to the desired level by addition of cream for standardizing fat and reconstituted skim milk powder is added for standardizing SNF content. After standardization, milk is homogenized at 65°C by two-stage process. Homogenization is necessary in the preparation of chocolate flavoured milk as cocoa particles may settle down during storage. After homogenization, filtration is the inevitable step which is to be done after homogenization. Then the sugar is mixed as coarse granules (@ 5-7%) or in the form of sugar syrup in hot milk followed by pasteurization at 71°C for 30 min. or 80°C for 15 sec and cooling to about 4°C. It is recommended to replace sucrose partially or completely with corn syrup. At this stage, desired flavour is added in the mix. In the preparation of sterilized flavoured milk, flavour is added @ 1.5-2.0 ml/liter of milk before sterilization. Several types of stabilizers such as sodium alginate, carrageenan or CMC may be added in flavoured milk up to 0.2 %, for improving the consistency of flavoured milks.

**Table 1 - Types of milk used for flavoured milk manufacture.**

Type of milk	Reference
Skimmed milk	Dalim <i>et al.</i> , 2012 <sup>[3]</sup> Muhammad and Ghulam 1992 <sup>[4]</sup>

Standardized buffalo milk • 2.2% fat • 3.0 % fat and 8.5 % SNF	Arora <i>et al.</i> , 2007 <sup>[5]</sup> Prakash <i>et al.</i> , 1975 <sup>[6]</sup>
Double toned milk (1.5% fat and 9.0% SNF)	Chourasia, 2010 <sup>[7]</sup> , Bhargav <sup>[8]</sup> Anandh <i>et al.</i> , 2014 <sup>[9]</sup>
Standardized cow milk • Fat- 4 % and SNF-8.5 % • 3 % fat and 9 % SNF • Fat- 2 %	Guberan <i>et al.</i> , 2016 <sup>[10]</sup> Repate <i>et al.</i> , 2010 <sup>[11]</sup> Jothylingam and Pugazhenthii, 2013 <sup>[12]</sup>
Standardized milk • 2% fat and 8.6% SNF • 1.5 % fat and 8.5 % SNF	Yau <i>et al.</i> , 1993 <sup>[13]</sup> Ravindra <i>et al.</i> , 2014 <sup>[14]</sup>
Reconstituted whole milk (3.0 % fat and 8.5 % SNF)	Prakash <i>et al.</i> , 2010 <sup>[15]</sup>
Sterilized flavoured milk	Kumari <i>et al.</i> , 2016 <sup>[16]</sup> Chatterje and Patel, 2016 <sup>[17]</sup>
UHT flavoured milk	Prakash <i>et al.</i> , 2010 <sup>[15]</sup> Mohyuddin <i>et al.</i> , 1990 <sup>[18]</sup>

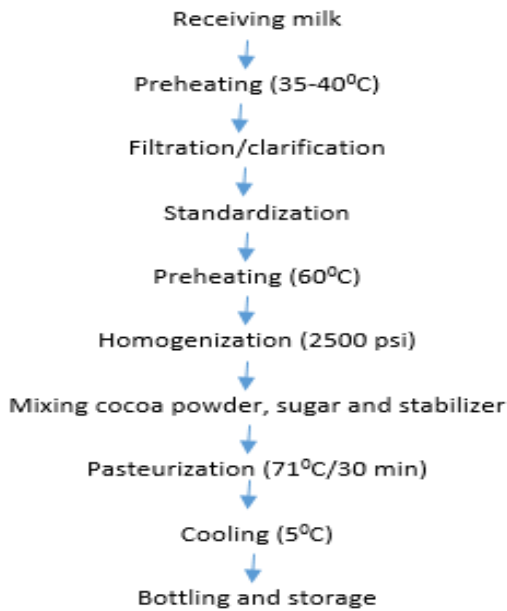
**2.1. Chocolate flavoured milk**

Chocolate milk is sweetened milk flavoured with chocolate or cocoa which has a dark color and chocolaty flavour. In the preparation of chocolate flavoured milk, the raw materials used range from low-fat milk to full-cream milk, sugar, cocoa powder and stabilizer are standardized and blended together then it is homogenized and pasteurized/sterilized. Sugar and cocoa powder are used to flavour the milk and carrageenan is used as a stabilizer in chocolate flavoured milk that helps to these flavourings in suspension. Different types of chocolate milks can be prepared depending upon its composition and the raw materials used. The different trends in utilization of different ingredients for its preparation involve:

- Cocoa powder - 1 to 1.5 %
- Sugar - 5 to 7 %
- Stabilizer - 0.2 %
- Fat level in milk - minimum legal standard.

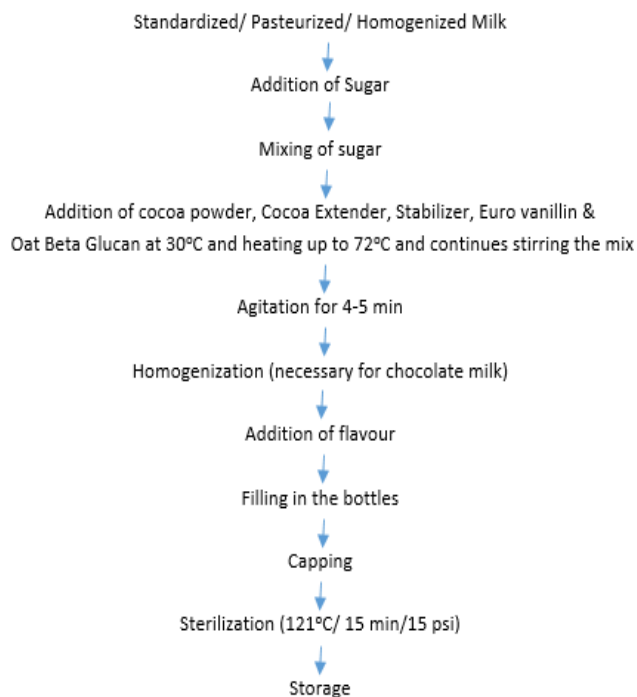
In the preparation of chocolate flavoured milk, the milk received is first standardized to the desired fat and solids-not-fat levels for preparation of drink. It is preheated to 35-40°C for efficient filtration/clarification and for standardization. After preheating, cocoa powder is added @1-1.5 % (w/v), sugar @ 5-7 % (w/v) and sodium alginate (stabilizer) @ 0.2 % (w/v) are slowly added with continuous stirring for proper mixing. After mixing, the milk is heated to 60°C and homogenized at 2500 psi and then clarified. The mixture is then pasteurized at 71°C/30 min., cooled rapidly to 5°C, bottled and kept under refrigeration (5°C) until used.

The detailed flow diagram for the manufacture of chocolate milk/ drink is given below:



**Fig. 1: Flowchart for manufacturing of chocolate flavoured milk (Source: De, 1976) [19]**

Prakash *et al.*, (2016) [15] prepared chocolate flavoured milk by UHT treatment. The flavoured milk was prepared by adding different concentration of sugar (7, 9 and 11 %), cocoa powder @1.5 % and carrageenan (0.00, 0.01, 0.03, 0.05 and 0.10 %) in reconstituted whole milk. After proper mixing, mixture is preheated to 95°C for 9 s and then final heating to 145°C for 6 s followed by cooling to ≤ 35°C.



**Fig. 2: Flow diagram of oat based chocolate flavoured milk (Source: Chatterjee and Patel, 2016)**

Chatterjee and Patel, (2016) [17] prepared chocolate flavoured milk by adding oat β-glucan (3%). Flavoured milk is prepared by mixing sugar, cocoa powder, carrageenan and oat in milk and sterilized at 121°C / 15 min. They found that the addition

of oat gives good viscosity and mouthfeel as compared to the ordinary flavoured milk due to the high fiber content. They concluded that the addition of oat in chocolate flavoured milk has improved mouthfeel and viscosity and is more acceptable by the sensory panel.

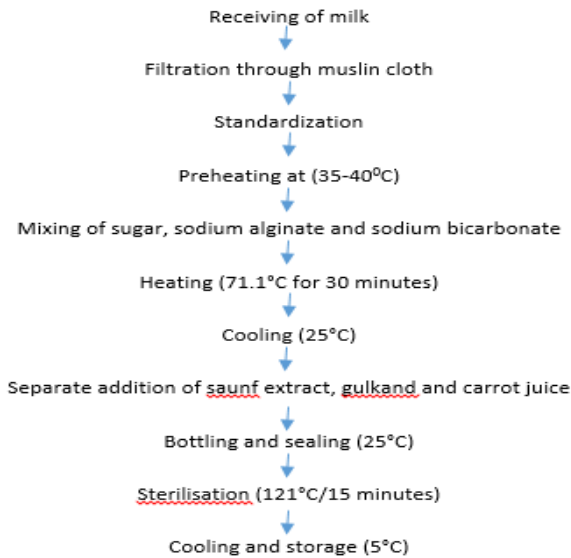
## 2.2. Sterilized flavoured milk

Sterilization of milk or flavoured milk is a high heat treatment process, done to destroy all the pathogenic microorganisms present in it. Sterilized products have excellent keeping quality and can be stored for longer periods at normal room temperatures. Flavoured milks are the most common sterilized dairy product. This type of milk combined the advantages of both sterilized and flavoured milk. The shelf life of sterilized flavoured milk is very high. According to FSSAI, “sterilisation when used in association with milk, means heating milk in sealed container continuously to a temperature of either 115°C for 15 minutes or at least 130°C for a period of one second or more in a continuous flow and then packed under aseptic condition in hermetically sealed containers to ensure preservation at room temperature for a period not less than 15 days from the date of manufacture; Bhargav, (2013) [8] prepared oat added flavoured milk by adding oat in different concentrations (1%, 2%, 3%) and sugar (7%). Oat added flavoured milk is prepared by adding oat and sugar in milk and sterilized at 121°C / 15 min. He concluded that oat added flavoured milk with 2 % oat was more acceptable on the basis of colour and appearance scores, aroma and flavour scores, mouth feel and obtained highest score for overall acceptability of the product as compared to flavoured milk with other oat concentration.

Chourasia *et al.*, (2011) [7] prepared sterilized herbal flavoured milk (HFM) by incorporating extract of certain spices such as cinnamon (50%), black pepper (10%), cardamom (20%), bay leaf (10%) and nutmeg (10%). In the preparation of herbal flavoured milk, double toned milk (1.5 % fat and 8.5 % SNF) was used in which 2 levels of herbal extract (6 and 12 %) and 2 levels of poppy seeds (0.4 and 0.8 %) was added. The product was filled in glass bottles and sterilized at 121°C for 15 min and stored at room temperature. The result obtained indicated that during storage period there was non-significant changes in fat and TS content whereas highly significant changes was obtained in pH during storage period.

Mohammad *et al.*, (2015) [20] prepared nutraceutical flavoured milk from cow’s milk by standardizing fat in 3 levels (2, 2.5 and 3.0 %), adding sugar (5, 6, 7 and 8 %), gulkand, aniseed extract and carrot juice is added @ 5-7 % as a nutraceuticals along with stabilizer (sodium alginate) and preservative (sodium bicarbonate). All the ingredients are mixed in milk and heated at 71°C/30 min followed by sterilization at 121°C for 15 min and stored at refrigeration temperature (5-10°C). Flavoured

milk with gulkand have significantly higher overall acceptability (7.16) scores than aniseed (6.98) and carrot flavoured milk (6.70).



**Fig.3: Flow diagram for sterilized nutraceuticals based flavoured milk (Source: Mohammad *et al.*, 2015)**

Kumari *et al.*, (2016) [16] prepared two types of flavoured milk viz. pasteurized flavoured milk and in bottle sterilized flavoured milk and used aspartame (700mg/l.) and neotame (10 mg/l.) as a sugar replacer. Pasteurized and sterilized flavoured milk was heat treated to 90°C / 20 min and 121°C / 15 min, respectively. In their study, they found that neotame was more stable than aspartame during pasteurization as well as in sterilization with minimal losses and even during storage period (4-7°C/7 days).

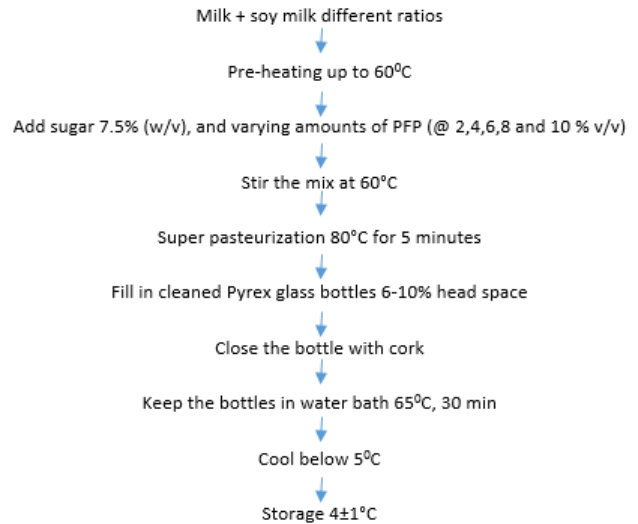
Thangaraj and Seethalakshmi (2015) [21] prepared Vitamin-C enriched flavoured milk. Double Toned Milk is preheated to 35-40°C then Vitamin-C microcapsules, sugar (10 %), cardamom (1 %) are added followed by pasteurizing and sterilizing the mix at 71°C/30 min and 121°C/15 min, respectively. After pasteurization and sterilization, flavoured milk was stored at ambient room temperature (30°C). The study concluded that the vitamin-C is stabilized in the flavoured milk during 30 days of its storage period.

### 2.3. Pasteurized flavoured milk

Pasteurised milk products are liquid products made from milk and cream intended to be used directly by consumers. This group of products includes whole milk, skim milk, standardised milk, flavoured milks and various types of cream. According to FSSAI, "Pasteurisation, Pasteurised and similar terms shall be taken to refer to the process of heating every particle of milk of different classes to at least 63°C and holding at such temperature continuously for at least 30 minutes or heating it to at least 71.5°C and holding at such temperature continuously for at least 15 seconds or an approved temperature time combination that will serve to give a negative Phosphatase Test. All pasteurised milk of different

classes shall be cooled immediately to a temperature of 10°C, or less."

Guberon *et al.*, (2016) [10] developed Palmyrah (*Borassus flabelifer*) fruit pulp flavoured pasteurized milk toned with Soy (*Glicine max*) milk. Flavoured milk was prepared by adding palmyrah fruit pulp (PFP) @ 2 %, 4 %, 6 %, 8 % and 10 %, soy milk @ 10 %, 20 %, 30 % and 40 % and sugar @ 7.5 % to cow milk. The mix is pasteurized at 80°C for 5 min. The study revealed that palmyrah fruit pulp flavoured milk with 6 % PFP and 10 % soy milk levels resulted in superior sensory and nutritional qualities compared to control sample.



**Fig. 4: Flow diagram for the preparation of palmyrah fruit pulp flavoured pasteurized milk (Source: Guberon *et al.*, 2016)**

Ravindra *et al.*, (2014) [14] prepared carbonated flavoured milk drink by standardizing milk to 1.5 % fat and 8.5 % SNF and incorporating CO<sub>2</sub> gas to extend the shelf life of the product. Sugar is added @ 10 % and cardamom is added as a flavouring agent. The drink is then pasteurized at 85°C for 20 min. followed by cooling to 15°C and filled into sanitized glass bottles for carbonation and storage. They concluded that the carbonated drink have higher shelf life than control (up to 30 days vs 17 days for control) by inhibiting the growth of microorganisms during storage.

Mittal and Bajwa, (2012) [22] prepared low calorie cardamom flavoured drink by adding sucralose powder and inulin as sugar and fat replacement, respectively. Fat content in control and low calorie drink (experimental) was standardized to 2 and 0.5 %, respectively and 8.5 % SNF. Sugar was added @ 6 % in control drink. In experimental sample, sugar was replaced by sucralose powder (72.6 ppm) and fat was replaced by inulin in different concentrations (0, 2, 4, 6 and 8 %). Cardamom powder @ 0.2 % was added in both the drinks as a flavouring ingredient. After blending all the ingredients together, mix is heated to 65°C for homogenization and pasteurized at 75°C for 15 s, then cooled and stored at 5°C. They concluded that the experimental drink with 4 % inulin, 72.6 ppm sucralose and 0.5

% fat have good viscosity and consistency and have better sensory scores than control sample.

Repate *et al.*, (2010) <sup>[11]</sup> prepared pasteurized flavoured milk by blending cow milk and safflower milk in different proportion 80:20, 70:30, 60:40 and 50:50 and heating at 75°C followed by cooling to 5°C and addition of colour and flavours. Prakash *et al.*, (1975) <sup>[6]</sup> prepared flavoured milk using soymilk and buffalo milk in different concentrations and using synthetic colour and flavours followed by pasteurization at 63°C for 30 min.

#### 2.4. Fruit flavoured milk

In the preparation of fruit based flavoured milk, permitted fruit flavours or essences, together with permitted colours and sugar are used. The method of preparation is similar to that used for chocolate milks/drinks. Some common flavours used are: Strawberry, orange, lemon, pineapple, banana, vanilla, carrot juice, apricot and peaches. Strawberry flavoured milk also demonstrates high acceptability with the consumer (Miller *et al.*, 2007).

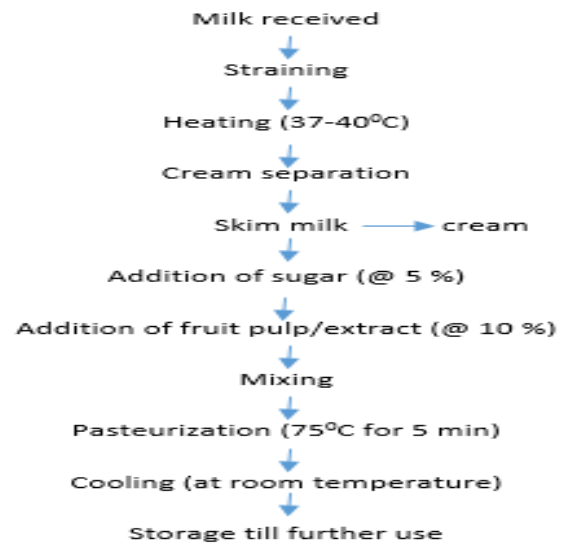
Pure fruit juices or syrups can be satisfactorily combined with milk to form milk shakes. In India, mango and banana are commonly used in preparation of milk shakes, particularly in the summer months. Fruit flavoured milks are manufactured by adding either the fruit pulp or fruit juices along with sugar in the milk. The general procedure of manufacturing these beverages involves: blending milk solids (either liquid whole/skim milk, whey, buttermilk or their counterpart concentrated or anhydrous form) with fruit juice, sugar solution, and stabilizer (generally pectin, carrageenan, CMC, gelatin etc.) and an edible acid (citric, lactic, malic or tartaric acid). Juices of natural fruits like apple, grape and pineapple have also been more widely used in preparation of this category of flavoured milk.

Dalim *et al.* (2012) <sup>[3]</sup> prepared chikoo and banana flavoured milk from skimmed buffalo milk. The flavoured milk was prepared by adding sugar (5 %) and chikoo/banana extract/pulp (10 %) in skim milk and mixed properly. After mixing, prepared mix was pasteurized at 75°C for 5 min, followed by cooling and storage at ambient room temperature. They concluded that based on sensory analysis of both chikoo and banana flavoured milk, chikoo flavoured is more acceptable.

Mohyuddin *et al.*, (1990) <sup>[18]</sup> prepared pineapple flavoured milk based drink using direct steam injection UHT technique by heating at 144°C for 3-4 sec. Pineapple flavoured milk was prepared by adding cane sugar (13 %), skimmed milk powder (2 %), apple pulp (3 %), Givaudan's stabilizer (0.30 %), citric acid (0.2 %), sodium sorbate (0.02 %), potassium sorbate (0.01 %) and pineapple flavour (0.07 %).

Singh *et al.*, (2005) <sup>[23]</sup> utilized skim milk and carrot juice in the preparation of carrot flavoured milk. In preparation of carrot flavoured milk, skim milk and carrot juice was mixed in

different ratios (82:10, 72:20 and 62:30) by weight basis. Sugar 8 % and gelatin 0.2 % was constant for all formulations. The flavoured milk is pasteurized at 72°C for 15 seconds. Finally they concluded that flavoured milk incorporated with 20 % carrot juice was more acceptable than other.



**Fig. 5: Flow diagram for preparation of fruit flavoured milk-based beverages (Source: Dalim *et al.*, 2012)**

#### 2.5. Herbal flavoured milk

Due to the increasing awareness about the advantages of herbal components, large number of population are moving towards herbal food products for their health benefits. Certain food products may be the best medium for conveying the medicinal benefits of herbs. There is also a need to find diverse technologies for value addition of milk. Several herbal plants or their components having medicinal value such as *Aloe vera*, cinnamon, tulsi etc. are added in certain dairy and food products. Along with its herbal value, herbal flavoured milk contains several other essential nutrients that makes them as a potential food supplement for adults and children. These are flavoured with different herbal plants or components to improve the nutritional and medicinal properties. Milk based product may be among the best vehicle for transportation of herbal components to human.

Jothylingam and Pugazhenth, (2013) <sup>[12]</sup> incorporated *Aloe vera* pulp extract @ 3, 5 and 7 %, artificial sweeteners aspartame and sucrose with cardamom flavour is used in low calorie herbal flavoured milk preparation, of that flavoured milk with 5 % *Aloe vera* is most acceptable based on sensory evaluation.

Palthur *et al.*, (2014) <sup>[24]</sup> developed herbal flavoured milk by addition of ginger extract (10%) with milk and sweetened with 5% cane sugar. The milk after addition of all the ingredients was pasteurized at 72°C for 16 min and cooled and stored at refrigeration temperature. Study revealed that, ginger herbal flavoured milk was found of having good overall acceptability. Sawale *et al.*, (2015) <sup>[25]</sup> prepared tulasi flavoured herbal milk by adding *Pueraria tuberosa* as herb component in different

concentration (0.2, 0.3, 0.4 and 0.5 %). *Pueraria tuberosa* is added into cow milk and pasteurized and sterilized at 72 °C/15 s and 121 °C/15 min, respectively for different samples. They found that addition of *Pueraria tuberosa* to milk at 0.4 % liked most based on sensory results.

## CONCLUSION

Perceiving the potential of drinking flavoured milk for having nutritional as well as therapeutic benefits. As children's are not friendly to consume plain milk as such, there is a necessity to modify milk in such a way that it would be more acceptable by the peoples of all age groups. Flavoured milk for having high nutritional value can be an excellent nutrient-rich replacement for this category of beverages including soft drinks and fruit juices etc. There are various types of flavoured milks has been developed with different tastes, flavours and extended shelf life flavoured milk (sterilized and UHT flavoured milk) like chocolate flavoured milk, fruit based flavoured milk, herbal flavoured milk, nutraceutical flavoured milk etc.

## REFERENCES

1. Murphy MM, Douglas JS, Johnson RD and Spence LA. Drinking flavoured or plain milk is positively associated with nutrient intake and is not associated with adverse effects on weight status in U.S. children and adolescents. *J Am Diet Assoc.* 2008; 108:631-39.
2. Frary CD, Johnson RK and Wang MQ. Children and adolescents' choices of foods and beverages high in added sugars are associated with intakes of key nutrients and food groups. *J. Adolesc Health.* 2004; 34:56-63.
3. Dalim M, Khaskheli M, Baloch MH, Soomro AH and Khaskheli GB. Production and comparison of banana and chikoo flavoured milk-based beverages. *Pakistan J. Nutr.* 2012; 11:600-04.
4. Muhammad I and Ghulam M. Keeping quality of pasteurized milk-based mango drink. *Pakistan J Agric Res.* 1992; 13:260-66.
5. Arora S, Narendra K, Gawande H, Sharma GS and George V. Stability of artificial sweeteners in flavoured milk. *Indian J Dairy Sci.* 2007; 61: 335-41.
6. Prakash C, Sharma, S.P. and Mulay C.A. Utilization of soymilk in flavoured milk preparation. *J Food Sci Technol.* 1975; 12: 163-65.
7. Chourasia, S. Development of novel sterilized herbal flavoured milk. M.Tech. 2011. Thesis submitted to Indira Gandhi Krishi Vishwavidyalaya Krishak Nager, Raipur, (CG).
8. Bhargav, K. Development of oat added milk drink. M.Tech. 2013. Indira Gandhi Krishi Vishwavidyalaya, Raipur (C.G.)
9. Anandh, CP, Ramasamy D, Surendraraj A and Gnanalakkshmi KS. Process optimization and shelf life study of retort processed rose flavoured milk. *Int J Food Agric Veterinary Sci.* 2014;4:36-46
10. Guberan G, Sarmini M and Silva KFST. Development of a palmyrah (*Borassus flabelifer*) fruit pulp flavoured pasteurized milk toned with soy (*Glycine max*) milk. *Int J Livestock Res.* 2016; 6:11–18.
11. Repate KC, Kamble VJ, Awaz HB and Thombre BM. Studies on preparation of flavoured milk from cow milk blended with safflower milk. *J Dairying Food HS.* 2010; 29: 92 – 96.
12. Jothylingam S and Pugazhenthir TR. Evaluation of dietetic Aloe vera enriched flavoured milk for its microbial quality. *CIBTech J Microbiol.* 2013; 3: 24-27.
13. Yau NJN, Mcdaniel MR Bodyfelt FW. Sensory evaluation of sweetened flavoured carbonated milk beverages. *J Dairy Sci.* 1988; 72: 367-77.
14. Ravindra, MR, Rao, KJ, Nath, BS and Ram, C. Extended shelf life flavoured dairy drink using dissolved carbon dioxide. *J. Food Sci. Technol.,* 2014; 51:130–35
15. Prakash S, Huppertz T, Karvchuk O and Deeth H. Ultra-high-temperature processing of chocolate flavoured milk. *J Food Engg.* 2010; 96:179-84.
16. Kumari A, Choudhary S, Arora S and Sharma V. Stability of aspartame and neotame in pasteurized and in-bottle sterilized flavoured milk. *Food Chem.* 2016; 196:533-38.
17. Chatterjee B and Patel T. Increased sensory quality and consumer acceptability by fortification of chocolate flavoured milk with oat B glucan. *Int J Clin Biomed Res.* 2016; 2:25-28
18. Mohyuddin G, Zaidi SKR and Al-Haq MI. Milk drinks prepared by UHT technique. *Pakistan J Agric Res.* 1990; 11:30-34.
19. De SK, Thomkinson DK, Gahlot DP and Mathur ON. Studies on methods of preparation and preservation of kheer. *Indian J Dairy Sci.* 1976; 29: 316-18.
20. Mohammad K, Rai DC and Andhare BC. Effect of different nutraceuticals on physico-chemical quality of flavoured milk. *Res J Animal Husbandry Dairy Sci.* 2015;6 : 61-65
21. Thangaraj S and Seethalakshmi M. Application of microencapsulation technology for the production of Vitamin-C fortified flavoured milk. *J Adv Dairy Res.* 2015; 3: 1-4.
22. Mittal S and Bajwa U. Effect of fat and sugar substitution on the quality characteristics of low calorie milk drinks. *J Food Sci Technol.* 2012; 49:704–12.
23. Singh C, Grewal KS and Sharma HK. Preparation and properties of carrot flavoured milk beverage. *J Dairying Food HS.* 2005; 24: 184-89.
24. Palthur S, Anuradha CM and Devanna N. Development and evaluation of ginger flavoured herbal milk. *Res J Agric Env Sci.* 2014; 1: 54-59.
25. Sawale PD, Singh RRB and Arora S. Stability and quality of herb (*Pueraria Tuberosa*)-milk model system. *J Food Sci Technol.* 2015; 52:1089–95.