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Milk Processing: Review

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Abstract

The goal was to establish approaches to the treatment and conservation of local milk in the LIPTAKO-GOURMA region of Niger. The conference comprises 600 milk industry members, 59% producers, 28.7% customers and 12.3% traders. Production data of 59%. Two primary milk processing forms were also reported: cooling and oxidation, which included 42.9% natural/spontaneous germination and 57.10% processor-based fermentation. Four methods were also set out for milk preservation, namely crude milk refrigeration, pasteurized or preserved milk, raw milk or hydrogenated milk fermentation, pasteurization of crude milk itself for sale or storage including insertion of a cocoon pepper cap into the fermented milk. Milking is still traditional and the use of old stuff is usually limited to the absolute lowest possible level. In view of these findings, the education of farmers on health and good practice to improve conventional methods at all levels of the local milk sector should be paid attention

Key words: Fermented milk, Hydrogenated, Indigenous Methods, Milk, Processors, Processing, Preservation and Survey

Introduction

In Sub-Saharan Africa, the consumption of milk but rather of imported and local milk is on a rising scale, but local dairy production can't cope with growing demand with overpopulation, growth and changed diets. This is because the bulk of the supply of local milk is not sold or processed. In fact, about 25-30% of milk is lost before it can be altered to the customer. The gap between the food composition areas that initially makes milk a poor source of nutrients can be a possible explanation for this lack of milk. In both nutritional and financial terms, milk plays an important role. [1].

Unfortunately, milk is a hydrophobic eukaryotic cell that responds to changes. In addition, because of its water content with higher protein quality, milk cannot be easily transferred or stored. Therefore, stabilization treatments are appropriate if consumption is not immediate. A recent Niger study cites a new factor, which changes the local specification of the dairy industry dramatically. Nonetheless, given the major challenges facing the meat industry, local milk sources are now generally available in some farmer regions. [2].

Firstly, the milk industry has been created and structured without enhancing its milk production. There is no possibility that more efforts should be made in support of the dairy industry. The conventional handling features of local production of milk are new. Milking is definitely not the easiest task in the tough conditions of the Sahel. Nevertheless, if risk is

properly addressed and conventional treatment as well as conservation methods efficiently mitigate these hazards, risks are not intrinsically severe. [3].

While Niger has confirmed milk-borne zoophytical disease and fever from the Rift Valley, very few studies were undertaken with a view to assessing milk production as well as to improving the storage and preservation of conventional data. About 35 percent of the meat supply to the social and economic life of the people in Nigeria comes from cabbages. If no records are available for animals raised in slaughterhouses, this figure can be higher. In most tropical areas, wild grasslands, and other food resources, domestic animals are mainstreamed as the main source of vitamins and minerals. Therefore, the use of turf grasslands is recommended for small herbivores. [4].

Physical And Physico-Chemical Properties

Milk is a white or yellow-white, opaque liquid. The colour is affected by milk fat globules and protein micelles, which spread and absorb light. Skim milk therefore preserves its white colour, too. A yellowish one, i.e. Colour yellow-green comes from carotene (ingested mainly in pasture grazing) present in the fat phase and riboflavin present in the aqueous phase. Milk tastes slightly sweet, although its odour and flavour are typically relatively small.

Milk fat exists as droplets or globules, surrounded by a membrane and emulsified in a serum of milk (also known as whey). After prolonged storage or centrifugation, the fat globules (called cream) are isolated. The fat globules float on the skim milk. The homogenisation of milk separates and emulsifies the fat globules so thinly that cream separation does not occur even after extensive usage. Various-sized proteins are dispersed in milk serum. They are called micelles and consist primarily of casein molecules 'calcium salts. In addition, milk contains lipoprotein particles, also called milk microsomes, which consist of cell membrane residues, microvilli, etc. along with the somatic cells that are usually the leucocytes. Specific proteins, carbohydrates, minerals, and other nutrients are solubilized in milk serum. The basic milk density reduces fat content and raises protein, milk sugar, and salts by growing quantities.

Methodology

The method for milk processing is displayed in fig 1.

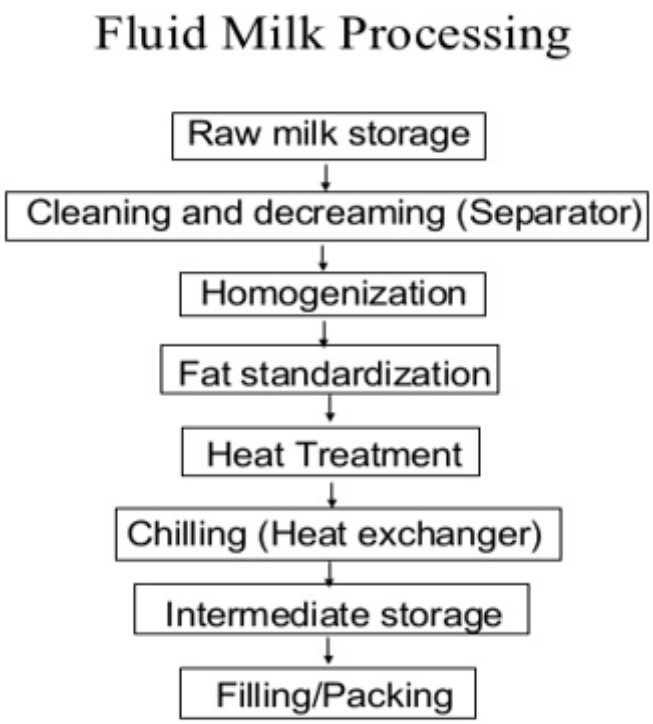

Fig.1: Step for the Process

1. Purification:

Usually the milk is delivered in a milk truck's cooled tank (at least −8°C. It is fed into a clarifier (self-cleaning disk separator) through a deaerating vessel for purification. These separators can process either cold or hot milk (40°C) at speeds of 4500–8400 rpm with up to 50,000 l / h throughput ability.

2. Creaming:

The milk is separated into cream and skimmed milk in a cream separator after heating to about 40 courses C (increase in cream-ing performance by lowering viscosity). Cream separators have a nominal capacity of 4700–6500 rpm, up to 25,000 l / hat speeds. Careful back-mixing will standardize the fat content of the milk.

3. Heat Treatment:

The liquid milk is heated to increase its longevity and to destroy the microorganisms that cause disease. The heat treatments used are: thermization, pasteurization, ultra-high temperature treatment, thermal process, and sterilization.

4. Reactions during treatment:

Heat treatment affects many constituents of milk. Casein is not, strictly speaking, a heat-coagulating protein; it only coagulates at extremely high temperatures. Heating at 120 °C for

5h dephosphorylates sodium or calcium caseinate solutions (100% and 85% respectively) and releases 15% of nitrogen in the form of fragments of low molecular weight.

Temperature and pH therefore strongly affect the relationship of casein and cause changes in micellar structure. The pH-dependent heat coagulation of skim milk is an ex-ample of such a transition. The temperature of coagulation decreases with the pH declining. Concentration of the salt also has an effect e. g., Milk heat stability decreases with an increase in free calcium content. All the processes of pasteurization in milk allegedly destroy the pathogenic microorganisms. The alkaline phosphatase inactivation is used to de-terminate the efficacy of pasteurization.

The whey proteins continue to denature at higher temperatures or longer heating periods – this correlates with the complete inactivation of acid phosphatase. Denatured whey proteins stop in the soluble within the pH spectrum of their isoelectric points and coagulate with casein due to the milk's to souring or chymosin action. Such milk protein co-precipitation is vitally essential. Thermal coagulation of skim milk during certain milk processing (as in the manufacture of cottage cheese). Milk therapy stimulates thiol groups e.g., the exchange reaction between thiol-disulfide and β-lactoglobulin occurs. This reaction increases the susceptibility of k-casein to chymosin, resulting in a more or less serious retardation of heated milk rennet coagulation.

Some more changes are added by heating the milk such as:

- Precipitation of calcium phosphate on casein micelles
- Maillard reactions between lactose and aminogroups (e.g. lysine) which cause milk browning and hydroxymethyl furfural (HMF) formation in a classical sterilization phase.
- δ-Lactone and methyl ketone formation from hydroxy- or keto-fatty acid esterified glycerides.
- Vitamin depletion B1, B6, B12, folic acid and vitamin C. Losses in the production of UHT milk of 10–30 per cent are likely. The sterilization kills approx. 50 per cent of B1, B6and folic acid vitamins and up to 100 per cent of Cand B12 vitamins.

5. Selection of Areas:

LIPTAKO GOURMA's three target areas are comprised of 12 milk basins, spread over 100 kilometres in the three areas, along a smeared road to support transportation of dairy, not to mention the collection of milk (essential milk distribution). Niamey, the city of Niger, was assigned all three regions. The three principal milk distribution centres are located in this region. [5].

6. Selection of People:

Up to 600 participants were randomly chosen from a list compiled and surveyed by the local authorities in the local dairy production process. The data quality is taken into account in this

choice. The collectively of the 600 specimens chosen for 12 dairy tanks is distributed in 50 per dairy tank. [6].

7. Data Collection Methods:

An interview with bend-section data collection was held. Data collected shall include: primary activities, gender, age, race, the kinds of resources and materials used, and sources of materials, traditional methods for the treatment and preservation of local milk; selected methods of motives; method for and against, and description of the scheme. The production units examined 37 population samples, five women's groups and three milk collection centres in Collie to examine the methodology system. [7].

Results

Manufacturers, retailers and dairy manufacturers, often selling milk, are involved. There are no subjects in a single project. There are three main types of behaviours overlapping. Farmers, traders, and dairy processors were also involved in the marketing of milk products. There are no issues in a single project. There are three main types of behaviours overlapping. CatLog centres and milk production units are stored in households. Milk is being handled. LIPTAKO GOURMA is the main form of milk processing by fermentation after pasteurization. As displayed in fig 2 [8].

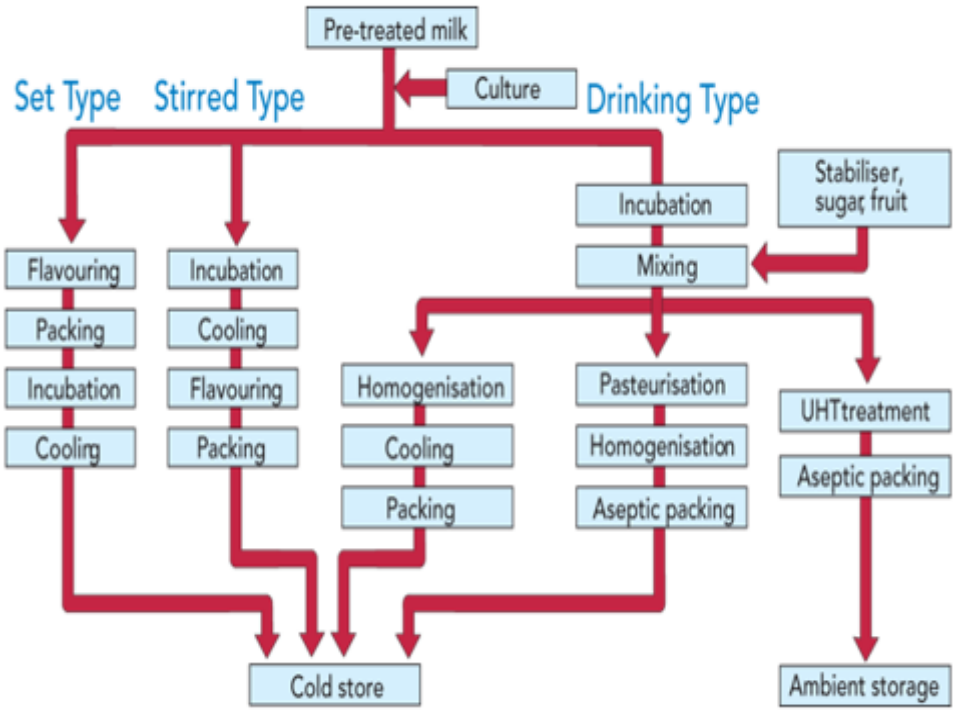

Fig.2: Different steps of fermentation

It will rely on the job, all duties are done manually, with simple sanitary steps like laundry and cookware unless they are really respected. 87.66 per cent of subjects collecting or

processing milk, whether milk is milked or purchased. Pasteurisation is a manufacturing form of local formula for children performed by 33.5% of the subjects. Road milk filtration with a sieve or a clean cloth and warming are the key measures for receiving local cow's milk. The LIPTAKO-GOURMA area conducts two different ways of fermenting milk (66.50 percent of the actors). [9]

Discussions

Usually, local milk is produced and sold through transactions. Nevertheless, new trends have arisen today on different levels in the local dairy sector (primarily the processing of milk) in reaction to rapid development of the dairy industry. Therefore, previous subjects have changed jobs or have been active in additional jobs. Every subject is also a distributor and can be a milk processor. Nevertheless, I should note that the bulk of the milk from commercial and agricultural farms in Sub-Saharan Africa is provided by a large number of directors / quad core sellers. Also in this region, production centres serve as sites for milk production.

The most important method of vaporization & stockpiling local milk is fermented milk not only because it is stored longer than raw milk & pasteurized milk. However, the high temperature in this region does not lead to milk survival, because in the area of bacterial growth temperature is of primary importance In the absence of a refreshing system, the next morning milking occurs early and selection is followed shortly afterwards.[10].

In this case it is better than the first precaution to remediate river water. The water level must be appropriate to reach a milk container while the liquid does not join a suitable absorption jar. Stagnant water does not allow for quick extraction of heat, but from time to time water should be refreshed. Branches and bags for the container need to be washed as milk may contain microorganisms. For milk processing, shady areas should be swept. [5]

Milk fermentation is a normal practice for protecting consumers against pathogenic foodborne microbes as a method of conservation. The temperature effect on the reaction rate follows the Arrhenius equation. Thus by observing a reaction and measuring the rate constants at two or three high temperatures, one could then extrapolate to a lower temperature with a straight line and estimate the reaction rate at the desired lower temperature. However, when the physical and chemical properties of the components of a food do not change with temperature, these data allow only a prediction of shelf life. For instance, a solid fat goes into liquid state as temperature rises. The reactants in liquid fat may be elastic and not in stable phase. Therefore, shelf life for lower temperatures would be underestimated.

Conclusion

Immediate consumption of raw milk is no longer an option, as the most common methods of processing and maintaining local milk in the LIPTAKO GOURMA area in Niger are pasteurization and fermentation, which seem to be best suited to adverse conditions. They do not need significant investment in equipment and are tailored to local traditions and the

climate. Specific storing of fermented milk is carried out using other techniques, range from natural cooling methods to pasteurized milk and fermented milk and from the use of Xylopia aethiopica pods. When processors are encouraged in their operations, hygiene and technology can be regulated.

References

1. W. Finnegan, J. Goggins, E. Clifford, and X. Zhan, "Global warming potential associated with dairy products in the Republic of Ireland," J. Clean. Prod., 2017.
2. S. Sethi, S. K. Tyagi, and R. K. Anurag, "Plant-based milk alternatives an emerging segment of functional beverages: a review," Journal of Food Science and Technology. 2016.
3. M. Salque et al., "Earliest evidence for cheese making in the sixth millennium bc in northern Europe," Nature. 2013.
4. P. Sfakianakis and C. Tzia, "Conventional and Innovative Processing of Milk for Yogurt Manufacture; Development of Texture and Flavor: A Review," Foods, 2014.
5. H. B. Wijayanti, N. Bansal, and H. C. Deeth, "Stability of Whey Proteins during Thermal Processing: A Review," Compr. Rev. Food Sci. Food Saf., 2014.
6. G. Bu, Y. Luo, F. Chen, K. Liu, and T. Zhu, "Milk processing as a tool to reduce cow's milk allergenicity: A mini-review," Dairy Science and Technology. 2013.
7. K. C. M. Verhoeckx et al., "Food processing and allergenicity," Food and Chemical Toxicology. 2015.
8. S. Chandrasekaran, S. Ramanathan, and T. Basak, "Microwave food processing-A review," Food Research International. 2013.
9. T. Huppertz, "Foaming properties of milk: A review of the influence of composition and processing," International Journal of Dairy Technology. 2010.
10. V. Raikos, "Effect of heat treatment on milk protein functionality at emulsion interfaces. A review," Food Hydrocolloids. 2010.