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CLEAN MILK PRODUCTION AND IT'S IMPORTANCE

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Introdution:

Globally, India ranks first place in milk production of about 221.06 million tonnes. Top 5 milk producing states with their share includes Rajasthan (15.05%), Madhya Pradesh (8.06%), Gujarat (7.56%) and Andhra Pradesh (6.97%). The average yield per day for exotic crossbred is 8.52 Kg per day and for indigenous/ non-descript is 3.36 Kg per day. The highest milk producing species is indigenous buffalo (31.58%) followed by crossbred cow (29.91%), non-descript buffalo (13.49%), indigenous cow (10.35%), non-descript cow (9.82%), goat (2.93%) and exotic cow (1.92%). Per capita availability of milk has significantly increased to 444 gms per day in 2022 where as in 2015 it was around 300 gms (Basic Animal Husbandry Statistics 2022).

Milk and dairy products plays a crucial role in human nutrition and it is considered as complete diet with a balanced combination of proteins, carbohydrates, fats, vitamins and minerals that are important for maintaining optimal body functions. Importance of milk in human diet has increased over time because of its versatility, availability and nutritional composition.

Need of clean milk production:

Clean milk refers to milk sourced from healthy animals through their udders, characterized by a pleasant taste, absence of dirt, relatively low bacterial content, and no harmful bacteria for human consumption. When it comes to superior milk, it should possess an extended shelf life, appropriate nutritional value, and maintain a normal taste, color, and odor, devoid of any foreign substances. The majority of milk production in India comes from rural and semi-urban household farmers, who operate in unorganized and unhygienic conditions and lack knowledge about hygiene and food safety**.** Furthermore, milk is a highly perishable matrix and easily favours the microbial growth and decreases the shelflife and precipitates risk of foodborne illness. In addition, milk is a perishable substance that readily supports the growth of microbes, shortens its shelf life, and raises the likelihood of foodborne illnesses.

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Clean milk production is vital for safeguarding public health, maintaining the well being of dairy animals, protecting the environment and fostering consumer trust.

Strategies of clean milk production:-

Animal management:

Regularly trim the long hair around the flanks, udder, and teats of the animals. Prior to milking, the animals should be washed and groomed daily to prevent dirt particles from falling into the milk. Additionally, it is important to periodically shave off the hair from the hind legs, udder, and tail of buffaloes, as they tend to wallow in dirty ponds and carry mud and filth on their bodies. It is essential to test them for contagious diseases, including tuberculosis and brucellosis, on an annual basis. Regular examinations should be conducted to detect udder and other infections. If any infections are found, they must be treated by a qualified veterinarian, and infected animals should be isolated from the rest of the herd to prevent further spread of the infection.

Animal house management:

Maintaining a clean and tidy environment in animal sheds is crucial for ensuring the health of the animals and the production of hygienic milk on the farm. These shelters often serve as breeding grounds for flies and mosquitoes, which can cause various physical discomforts and infectious diseases for the animals. Daily tasks include cleaning bedding materials such as sawdust, paddy, and straw, as well as thorough cleaning of water and feeding areas. If the floor is made of mud, a layer of clean soil, approximately 12-15 cm thick, should be removed and replaced. Milk parlors should also be cleaned and washed regularly. To facilitate proper drainage, sloped drains with a width of 6-12 inches and a depth of 2 inches should be installed, ensuring a gradient of 1 in 60 for efficient water flow. Adequate lighting and ventilation must be provided, and disinfection of the housing can be done using a flame blower or suitable disinfectants like formaldehyde or phenols.

Feeding management:

It is important to always provide animals with a diet that is high in nutritional value. This is because a healthy animal will produce cleaner milk. By feeding animals healthier diets, the likelihood of diseases occurring is reduced. Regularly cleaning water tubs and feeding mangers is crucial to prevent the growth of harmful microbes. Avoid feeding animals dusty feed concentrates, and instead opt for pellets or slightly moistened feed. Do not feed animals with leftover feed that may have been spoiled by mold or other microbes. Additionally, it is essential to prevent animals from drinking dirty water, as it can result in waterborne infections.

Udder hygiene:

Cows rest lying down, which can result in their udder coming into contact with dirty bedding. Poor udder hygiene can lead to the transfer of microorganisms to the milk during milking or through the teat opening, increasing the risk of mastitis. To maintain cleanliness, teats should be washed with a cloth soaked in warm disinfectant solution and dried with a separate cloth. Immersing the teats in a disinfecting agent after milking removes any remaining milk droplets that could harbor harmful microorganisms. Drying the disinfectant forms a thin protective layer around the teat opening, mechanically preventing the entry of microorganisms through the teat canal.

Milking vessels Hygiene:

Milking vessels should be made from non-rusting and non-absorbent materials, preferably stainless steel. It is important that all utensils are free from dents, cracks, and crevices, as these areas are difficult to clean and may harbor bacteria. The vessels should have a small opening. Before and after milking, they should be thoroughly cleaned using hot water and certified detergents or chemicals. The detergents and chemicals employed must be non-injurious and non-abrasive. After cleaning, the vessels should be placed upside down to ensure complete water drainage, thereby preventing contamination from air, insects, rodents, reptiles, and similar sources.

Milkers Hygiene:

Milkers should exhibit any symptoms of contagious diseases. Additionally, they should not have any open cuts, sores, boils, or infected wounds that could potentially contaminate the milk with microbes. The milker should be in good health and free from infectious conditions such as Cholera, Typhoid, Scarlet Fever, and Tuberculosis. It is important for the milker to always wear clean clothing and a cap, and maintain proper personal hygiene, including regular haircuts, beard trimming, and nail cutting to prevent any microbial contamination. Prior to hand milking, it is essential to wash hands with soap or detergent and dry them with a clean towel. The milker should avoid activities such as coughing, sneezing, spitting, or smoking while milking.

Chilling of Milk:

Chilling milk immediately after milking is of utmost importance due to several reasons. Firstly, rapid cooling inhibits the growth of harmful bacteria present in raw milk, reducing the risk of microbial contamination and subsequent spoilage. Secondly, chilling helps to preserve the nutritional integrity of milk by slowing down enzymatic reactions and microbial activity that can degrade its quality and nutrient content.

The strained milk should preferably be chilled immediately to 4℃ to prevent the proliferation of micro-organisms. In locations where milk is stored in cans prior to transportation, the most suitable cooling solution is the use of bulk can coolers. Common cooling methods employed include household refrigeration, direct expansion surface coolers, expansion bulk tanks, ice banks, and chilled water. Efficient cooling techniques will effectively hinder the proliferation of mesophilic and thermophilic microbes.

Awareness to farmers:

Farmers should be provided with educational aids and programs to raise awareness about the significance of producing clean milk. These aids can take the form of charts and posters displayed at village, cooperative societies, and milk collection centres. They should focus on enlightening farmers about proper milk handling procedures, from udder to reception dock, emphasizing the importance of maintaining a hygienic environment, using clean utensils, and ensuring the availability of milk cooling bulk tanks and coolers.

Conclusion:

In conclusion, clean milk production is essential for ensuring the health and safety of consumers while promoting sustainable farming practices. By adhering to strict hygiene standards, implementing proper animal welfare measures, and employing environmentally friendly techniques, farmers can produce milk that is free from contaminants and harmful substances. Clean milk production also contributes to the overall well-being of dairy animals, improving their health and productivity. Moreover, by reducing the use of antibiotics and chemicals, clean milk production minimizes the environmental impact of dairy farming. Embracing clean milk production methods is not only crucial for consumer satisfaction but also for building a more sustainable and responsible dairy industry.