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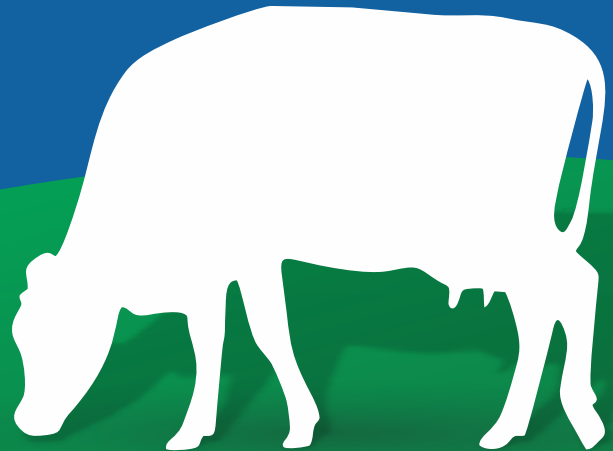
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From the Pen of Chief Editor



Dairy Processing: Competitive Industry Considerations

For hundreds of years, milk has been processed using conventional techniques to create dairy products.

However, research is constantly being done on new technologies in order to create new products or enhance those that already exist. More specifically, modern processing techniques are used to modify the texture of dairy products, enhance their organoleptic qualities, ensure their safety, lengthen their shelf lives, and finally, improve their nutritional and health benefits.

Dairy processing entails converting raw milk into fluid milk products as well as a variety of dairy products such as butter, yoghurt and fermented milks, cheeses, dry milk powders, dry whey products, ice cream and frozen desserts, and refrigerated desserts at dairy processing plants. It also involves chemical, microbiological, physical, and engineering principles, all of which must be understood for effective dairy plant management.

Processing dairy products provides small-scale dairy producers with higher cash earnings than selling raw milk and better access to regional and urban markets. Fluid milk products, butter and butter products, concentrated and dry milk products, cultured milk products, cheese products, whey products, ice cream and frozen desserts are all examples of dairy products.

Milk processing helps to prevent food-borne illness by preserving milk for days, weeks, or even months. Through methods like fermentation or cooling, which is the factor most likely to affect the quality of raw milk, it is possible to extend the shelf life of milk by several days.

The dairy sector is always evolving. New processing techniques are producing products of higher calibre. In addition to increasing milk production and process effectiveness, new processing techniques can help reduce waste.

Overall, the dairy sector is going through a period of expansion and innovation. Dairy processors need to take a flexible and creative approach to facility planning and operation in order to take advantage of these shifts in a market that is competitive and becoming more and more diversified.

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Lumpy Skin Disease – An Emerging Skin Problem In North India



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The acute viral disease lumpy skin disease (LSD) in cattle is characterised by the abrupt emergence of many skin nodules of varied sizes and extents. Despite the disease's low fatality rate, there are significant economic losses. Originally this disease was found in Africa but now it has also spread to countries in the Middle East, Asia, and Eastern Europe. Following its outbreak in Odisha in August 2019, and later on LSD is now widespread in India, which had previously been free of it. The World Organization for Animal Health (OIE) announced this in November 2019.

- The most distinctive clinical sign is widespread, firm, painful nodules of the skin and mucosal surfaces.
- Attenuated virus vaccines may be used to help control the spread of infection

Etio-pathogenesis

Lumpy skin disease virus (LSDv), a DNA virus of the Poxviridae family and genus Capripox virus, is the culprit behind LSD. LSD has been linked to three main categories of cytopathic agents: Group I

(Orphan strain), Group II (Allerton strain), and Group III (Neethling strain). The cause of LSD is now understood to be the Neethling strain. This genus also includes the viruses that cause goat and sheep pox. Both the sheep pox virus and the goat pox virus share genetic and antigenic similarities with the Neethling prototype strain.

After the pathogen enters the body, viremia with fever occurs, followed by localization in the skin, digestive system, and respiratory tract, as well as the development of inflammatory nodules. Young calves, breastfeeding cows, and malnourished people all get more severe sickness in a natural infection.

Epidemiology

LSD, formerly known as "pseudo urticaria," was first identified as an epidemic in 1929 in Zambia (then Northern Rhodesia), and it has since spread over all of Africa. Eastern Europe and the Middle East have both seen its spread. Disease is most widespread along water courses and on low ground areas, and it can arise either epidemically or



Cow with LSD showing erupted, nodular, circumscribed lesions on the body



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sporadically with high prevalence in the moist summer and fall months.

Economic Impact:

Millions of dairy farmers and meat sellers across the world are being hit hard by LSD outbreak affecting their cattle. The small-scale cattle farmers who earn a living by selling off a few litres of milk have suffered enormously. Most of these farmers are illiterate and aren't aware of prophylactic measures that are vital to stop the progression of LSD.

Host Susceptibility

Because LSDV only infects cattle (*Bos indicus* and *Bos taurus*) and water buffalo, it is very host specific (*Bubalus bubalis*). Disease does not transmit to animals of different species. When it comes to cattle, the thin-skinned *Bos taurus* breeds are more prone than the thick-skinned native types. All breeds of cattle, regardless of sex or age, are prone. Young calves and dairy cows exhibit serious illness. Among the wild animals, the giraffe (*Giraffa camelopardalis*) is vulnerable. Mice, guinea pigs, and other laboratory animals are resistant to LSDv infection.

Mode of Transmission

There is still a good deal of information lacking about the transmission of LSD. Evidence to date supports transmission of the virus via arthropods such as insects or ticks (these are termed virus "vectors"). Ingestion of feed and water tainted with infected saliva, or fomites c.g., is another less likely method of virus transmission. Another option is to use unsterilized hypodermic needles repeatedly. Bulls with LSD infections can shed the virus in their semen, and this process can last for at least 42 days after the infection. Lesions or nodules on the skin are significant sources of infection. Despite the necrotic material being fully dried, LSDv has been observed to persist in skin lesions for at least 39 days after infection. Animals that are viremic are a key source of infection that may last for upto 2 weeks. Movement of infected cattle can also be a significant factor in the spread of LSD over large distances.

Clinical signs

- Incubation Period: 4 to 14 days.
- Initial Signs: Salivation, lacrymation, and mucopurulent nasal discharge,
- Other signs (may or may not): Swelling or edema of brisket, dewlap, and lower portions of the legs.

- Rectal temperature: above 41°C and/or biphasic.
- Typical Skin lesions: Nodules are well circumscribed, round, slightly raised, firm, and painful and involve the entire cutis and the mucosa of the GI, respiratory, and genital tracts. Nodules form, 'Sitfast' skin exists. Nodules in every part of the body, including the lungs, perineum, vulva, mouth, and nasal passages. Nodules may later become necrosed, revealing the areas beneath.
- Other systems affected: Lymphadenopathy, milk production falls, mastitis, acute orchitis, atrophy of the scrotum/testes, preputial mucosa, and glans penis, bulls used for breeding produce less sperm, pneumonia due to extensive upper respiratory tract necrosis.

Diagnosis:

The presence of the typical skin nodules is strongly suggestive of LSD. F Disease can be confirmed with a laboratory diagnosis, with tests available to detect the DNA of the virus or antibodies. For molecular identification of viral antigen Samples of pus discharge, blood, semen, and scabs must be processed. Nodules, scabs, and crusts on the skin have higher levels of LSDV, making them a better option.

The most effective technique for detecting LSDv is polymerase chain reaction (PCR). ELISA, histopathology, cell culture, electron microscopy, and viral neutralisation tests for the identification of antigen or antibody to LSDv are further diagnostic procedures.

Differential diagnosis

In moderate cases of LSD or during the initial outbreak, the clinical signs and lesions could be mistaken for pseudo lumpy skin disease, which is brought on by the Bovine Herpes Virus (BHV)-2. In comparison to LSD, BHV-2 has a shorter course, creates more superficial skin lesions, and is a milder condition. Theileriosis of the skin, photosensitization, dermatophytosis, and insect bites must occasionally be distinguished from pseudo-cowpox, foot-and-mouth disease, bovine viral diarrhoea, malignant catarrhal fever, infectious bovine rhinotracheitis, and cutaneous theileriosis.

Treatment: LSD's therapeutic method is symptomatic.

- NSAIDs,

- Corticosteroids,
- Insect repellent,
- Antibiotics (ideally long acting),
- Antipyretics and other medications are used sparingly.

Immunization and vaccines

Any of the sheep pox, goat pox, and LSD virus strains can be utilised as a vaccine strain to protect cattle against LSD due to antigenic homology and cross protection. LSD has been widely protected against by two vaccinations. However, all of these can cause local tissue responses in cattle.

The only practical method for limiting the spread of LSDV in an endemic area, though, is vaccination. After recovering from a natural infection, immunity lasts a lifetime. Calves from immunological cows develop maternal antibodies and develop clinical disease resistance for roughly six months.

Vaccination with attenuated virus offers the most promising method of control and was effective in halting the spread of the disease.

Prevention and Control

Using live attenuated vaccinations against the sheep and goat pox viruses as well as a comparable live attenuated vaccine against the LSD Neethling strain, countries like Israel, Ethiopia, and Lebanon have successfully suppressed LSD outbreaks. Other preventative strategies include limiting the movement of diseased cattle, controlling vectors, disposing of carcasses properly, managing breeding bulls, etc.

Summary

The long-term negative consequences of LSD are linked to significant economic losses in the form of decreased milk output, chrome corrosion, decreased hide quality, infertility, sterility, abortion, and death. Lumpy skin disease virus causes a severe disease in cattle characterised by nodules in the skin. Transmission of LSD occurs via insect vectors and vaccination is the most effective means of control. Since the presence of a disease results in tight trade restrictions, the effects are also devastating on a national level. The main lesson to be learnt from the current European LSD epidemic is to be vigilant of emerging diseases. Therefore, it is crucial for everyone to work together to regulate and contain this new issue with the cattle population.

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Ice Cream : Origin, Types and Processing



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Origin of Ice Cream

There is no text and literature which can exactly describe the origin of ice cream. According to ancient manuscripts a frozen product constituted by mixing of fruit juices with snow (today known as water ice) was consumed by Chinese people. There is a century lag in literatures and after several years ice cream reappeared in different forms in Italy in the Middle Ages. From Italy, ice cream spread through Europe during the 17th century, and remained as a luxury product for the royal dinings. Towards the end of 19th century, industrial ice cream production was started when the first mechanical refrigerators were introduced.

Ice Cream and Related Products

Ice cream and related products can be categorized in various classes. As classification varies country to country, the following should be considered as a guideline only. Mainly it depends on the fat content of ice cream to categorise in a related class. More than 9% fat content is required in some countries to "qualify" for the ice cream category. Less than this level, the product is typically called milk ice, whereas ice cream with more than 12 to 13% fat is often categorized as either luxury or premium. The fat can be either of animal or vegetable origin.

Ice Cream Related Products

Sorbet is a frozen, typically fruit juice-

based product having certain amount of overrun. The mix goes via a continuous freezer where air is introduced. Sorbet products characteristically have fresh eating properties and devoid of fat or milk solids-non-fat (MSNF). Owing to the higher viscosity from the freezers, fruit pieces and other inclusions can also be added to the sorbet product before filling. To achieve a final product with more body, ice cream manufacturers also produce sherbet that contains a small portion of fat and/or MSNF but retaining the fresh eating properties associated with sorbet. In 1980s, frozen yoghurt obtained a high popularity in the US owing to its relatively low fat and calorie content. Weight and cholesterol watchers were delighted. Typically, a frozen yoghurt is a blend of standard ice cream mix and yoghurt with live bacteria, yoghurt ice cream have a fresher taste than standard ice cream. Nowadays, Greek yoghurt is popular owing to its high protein content. Water ice is a blend of sugar, fruit concentrates, stabilizers, flavour and colour. The finished mix is pasteurized and mainly filled into moulds (or pockets) on a rotary or in-line moulding machine. Freezing takes place in the pockets, which pass through a cold brine (salt solution) freezing zone. When the water ice is frozen, it is extracted from the pocket. Water ice sticks are typical children's products and great varieties in colour and flavour are quite



common. Combinations together with an ice cream core also make the products appealing for adults. The development of extrusion technology has evolved a new category called as extruded water ice. Actually, a water ice containing a whipping agent is pumped to the continuous freezer, where air incorporation and a significant part of the freezing of water takes place in the continuous freezer cylinder before extrusion. The final product typically contains 20 to 30% air, is very fresh and has a clean flavour release.

Type of ice cream	Fat % wt	MSNF % wt	Sugar % wt	E/S % wt	Water % wt	Overrun % vol
Dessert ice	15	10	15	0.3	59.7	110
Ice cream	10	11	15	0.5	63.5	100
Milk ice	4	12	13	0.6	70.4	85
Sherbet	2	4	22	0.4	71.6	50
Water ice	0	0	22	0.2	77.8	0
Sorbet	0	0	22	0.5	77.5	30-50

Table 1 (composition of various products)

Fat	Milk, cream, butter or vegetable fat
MSNF	Milk solids-non-fat (protein, lactose, salts)
Sugar	Sucrose, glucose/dextrose or syrups
E/S	Emulsifier and stabilizer, e.g. monoglycerides, locust bean gum (LBG), guar gum or carrageenan
Overrun	Amount of air added to the product
Other ingredients	Flavours, colours, fruit, nuts and chocolate pieces may be added during processing

Box 1(terminologies)

Terminology Related to Ice Cream

Based on the filling methods, ice cream products categorised into the following categories:

• Filled

Ice cream is filled into cups, cones or containers/tubs, usually combined with many flavours and can be decorated with cream, chocolate, dry materials and ripple.

• Extruded

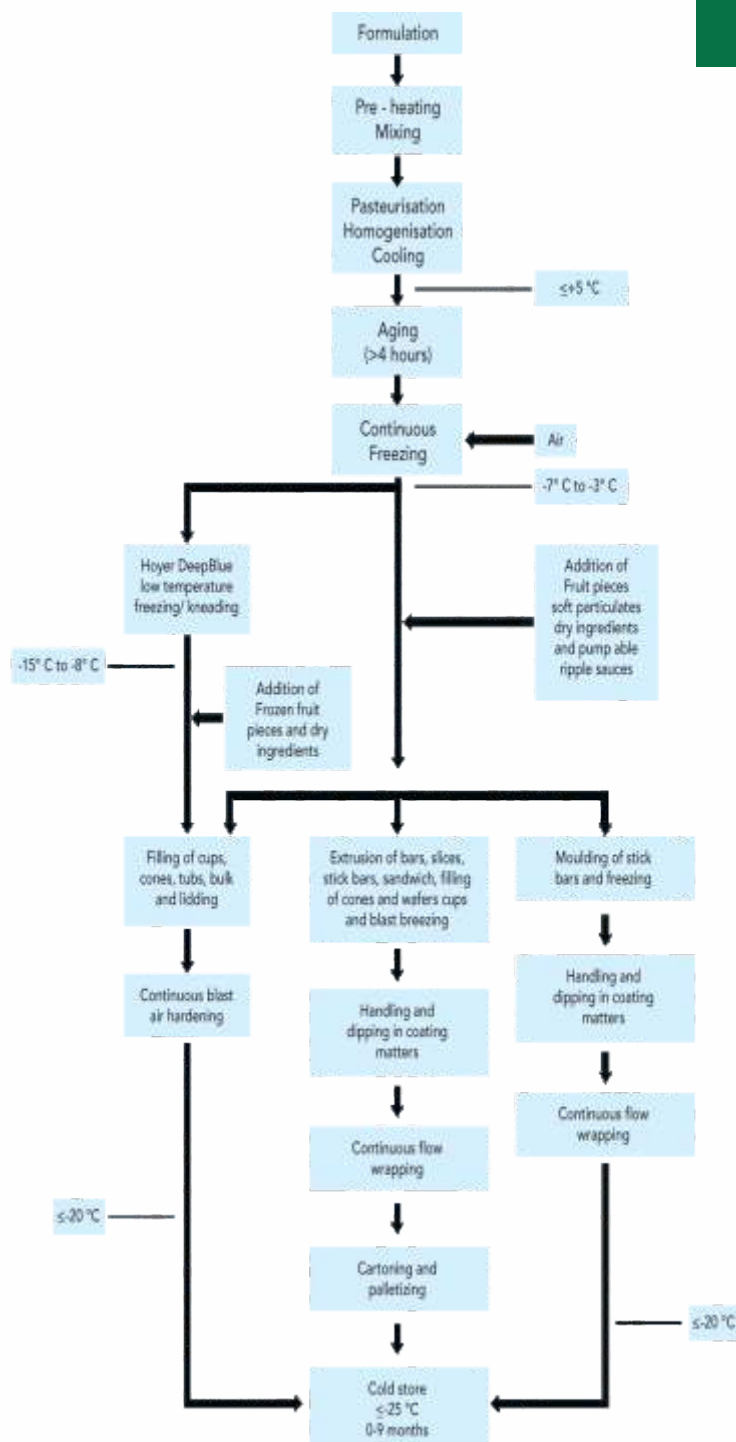
Ice cream is usually extruded onto a tray by using extrusion with a cutter. A vast variety of products may be produced including sandwiches, stick novelties, ball-top cones, desserts etc. Extrusion technology provides the possibility to work with ice cream drawn at much lower temperature where the viscosity of the ice cream is more due to more water being frozen into ice crystals. This generates ice creams that are both smoother due to smaller ice crystals and creamier due to higher churning of fat compared to moulding and filling technologies.

• Moulded

Ice cream or water ice mix is filled into moulds and frozen to form stick novelties. After extraction, the products are being dipped in chocolate or other coatings.

Ice Cream Processing

Fig 1 (ice cream process)



Microbes in Fermented Dairy Products



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Milk represents a good source of nutrients and liquid for hydration and is known to humanity thousands of years ago. The fermentation of milk provides a simple way to increase its shelf-life while improving its safety. Different strains of bacteria and fungi are used for fermentation of milk in order to produce a wide variety of dairy products viz. curd, yogurt, cheese, kefir and kumis. The main bacteria are lactic acid bacteria that are used for coagulation of milk and thereafter, these can be processed for diverse products.

Mechanism of Fermentation

Microbes ferment the carbohydrates present in milk, mainly lactose to lactic acid. Lactic acid act as a preservative for milk and also its low pH (4.5- 5.0) inhibit the growth of harmful micro-organism, hence increasing the shelf life of the product. The acid precipitates the protein in milk, therefore fermented products are usually of thicker consistency than milk. The high acidity and low pH hinders the growth of other bacteria including pathogens. Humans learned to control fermentation processes from the initial accidental events in fermentation. This learning of

controlled fermentation of milk in domestic practices had given way to a diverse dairy products influenced by the habits of the different ethnicities, geographical environments and the type of dairy farming.

Fermented Products

Various types of fermented milks and derived products have been developed in all the parts of the world each with its own characteristic history. Their nature depends very much on the type of milk used, on the pre-treatment of the milk, on the temperature (climate), conditions of the fermentation and on the subsequent technological treatments. Most commonly used dairy products include curd, yogurt, cheese, kefir and kumis.

1. Curd (Dahi)

Curd is manufactured using single or mixed cultures, *Lactococcus cremoris*, *Lactococcus diacetylactis*, along with *Leuconostoc* species and *Lactococcus lactis*, a combination of acid and flavor producing bacteria. These bacteria are responsible for imparting firm body, sweetness, and a mild acidic flavor to the curd increasing its acceptability to the consumer.





2. Yogurt

Yogurt is a popular fermented dairy product produced by lactic acid bacteria, including *Streptococcus thermophilus* and *Lactobacillus delbrueckii* ssp. *bulgaricus*. During yogurt production, these bacteria produce lactic acid, decreases pH and causes milk protein to coagulate. Their metabolites, such as carbonyl compounds, non-volatile or volatile acids, and exopolysaccharides, strongly affect the quality of yogurt.

3. Cheese

Cheese is a fermented milk product and historically serving as a mean of preserving milk. Cheese making occurs in three main stages:

In the first stage, milk is moulded into the solid curd and the liquid whey by the coagulation of the milk protein, casein. The coagulation of casein is done through two complementary methods: acidification and proteolysis. Acidification occurs when lactic acid bacteria ferment the disaccharide lactose to produce lactic acid. Originally, it can be done by naturally occurring lactic acid bacteria in the milk but today, dairy industries usually standardize the process by the addition of the domesticated bacterial cultures, including strains of *Lactococcus lactis*, *Streptococcus thermophilus* and *Lactobacillus* sp. The production of acid by these bacteria causes casein to coagulate slowly. This process is often

assisted by the addition of the enzyme, chymosin (active ingredient in rennet). Chymosin removes negatively charged portion of casein that results in rapid aggregation of casein proteins.

In the second stage, curd is separated containing the casein and milk fat from the whey. Depending on the type of cheese, the curd can be heated, salted, pressed and is moulded into various shapes and sizes. Cheese can be eaten afresh at this point, or it can be left to age in a damp, cool place.

During the third/aging stage, cheese is truly transformed from fresh cheese into the myriad flavours, aromas, and textures of mature cheese. As a normal part of the aging process, cultures and lactic acid bacteria continue to grow and metabolize the interior of the cheese, while the surface of a cheese is colonized by bacteria and fungi that form a multispecies bio-film called as 'rind' of the cheese. Diversity in the cheese flavor, smell and texture is because of different microbes. Cheese flavor is associated with the amino acid catabolism. The ability of lactic acid bacteria and other cheese microorganisms to degrade amino acids to aromatic compounds is highly strain dependent.

4. Kefir

This light alcoholic beverage is prepared by inoculation of raw milk with irregularly shaped, gelatinous white/yellow grain called kefir grains.

These kefir grains have varying and complex composition of microbial species such as of lactic acid bacteria, acetic bacteria, yeasts and fungi. These microbial species are classified into four groups: homofermentative and heterofermentative lactic acid bacteria, and lactose and non-lactose assimilating yeast. In that way, *Lactobacillus paracasei* ssp. *paracasei*, *Lactobacillus acidophilus*, *Lactobacillus delbrueckii* ssp. *bulgaricus*, *Lactobacillus plantarum*, and *L. kefirifaciens* are predominant species. However, these species represent only 20% of the *Lactobacillus* in the final fermented beverage, with the remainder consisting of *Lactobacillus kefirii*. The predominant species of fungus are *Saccharomyces cerevisiae*, *S. unisporus*, *Candida kefyri*, and *Kluyveromyces marxianus* ssp. *marxianus*.

5. Kumis (Koumiss)

Kumis and kefir are similar dairy products but kumis is produced from a liquid starter culture as compared to solid kefir "grains". It has mild alcohol content as compared to kefir because mare's milk contains more sugars than other milks. It is very popular in Kirgizstan, Mongolia, Kazakhstan and some regions of Russia and Bulgaria. It is usually made from mare's milk by spontaneous fermentation of lactose to lactic acid and alcohol. Depending on the lactic acid contents, kumis is of three types- strong, moderate and light.

A. Strong kumis: It is generated by lactic acid bacteria like *Lactobacillus bulgaricus*, *Lactobacillus rhamnosus*. There is acidification of milk to pH 3.6–3.3 and conversion ratio of lactose into lactic acid is about 80–90%.

B. Moderate kumis: It involves *Lactobacillus* bacteria like *Lactobacillus acidophilus*, *Lactobacillus plantarum*, *Lactobacillus casei* and *Lactobacillus fermentum* with restricted acidification properties that lower the pH to 4.5–3.9 at the end of the process, and the conversion ratio averages 50%.

C. Light kumis: It is a slightly acidified product (pH 4.5– 5.0) and is produced using *Streptococcus thermophilus* and *Streptococcus cremoris*.

Adulteration In Dairy-based Sweets and Consumer Awareness



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Sweets are the most loved food among the people of India. Milk and milk products are present in most sweets. Due to high demand and low supply of raw material, the shopkeepers adulterate milk-based sweets for high profit. The homemade sweets are the best and healthy. But due to the busy life schedule of today's nuclear family, the sweets are purchased from local markets. The unethical adulteration is done in these products for monetary benefits, which can be very harmful to the health of the consumer. Milk can contain adulteration of water and plant-based starch that can be harmless and could also contain urea, pond water, soap, chalk, and some chemical preservatives. The common raw material used for sweet preparation is Ghee, Butter, Edible oil, Sugar, Saffron, Rava, Milk, Khoya, Wheat flour, besan, etc. As homemade sweets are best when the material used for preparation should be checked for adulteration. Here are some tests that can help you to identify which one is adulterated or unadulterated at home. The water in milk can be treated easily by putting a drop of milk on a slanting polished surface, pure milk will flow slowly and leave a white trail. While adulterated milk will flow fast without leaving a mark.

The khoya and panir are rampant during the festive season. The starch is added to khoya, paneer, and milk (to increase solid not fat) for increased weight for money-making and mashed potato/sweet potato added in ghee can be detected by the addition of one drop of iodine solution if a blue color appearance shows the presence of potato or starch. Generally, sweets have varki.e silver covering. Most sweet sellers are using aluminum foil instead of using silver vark on Kajukatli. These aluminum leave/foil used for vark can cause infection and can also lead to stomach cancer if consumed in large quantities. These Aluminum foils can also be detected easily because the silver foil burns away completely leaving the glistering small ball of white ash but aluminum foil leaves ashes of black color. In addition to this silver foil is very thin and if crushed between two fingers, crumbles to powder. Aluminum foil is comparatively thicker and only breaks to small shreds when passed similarly.

In ghee and butter, the Vanaspati can be checked by taking one teaspoon of melted ghee or butter with an equal quantity of HCL in a test tube and adding one





pinch of sugar to it. Shake well for one minute and after 5 minutes, the presence of crimson color in the lower acid layer indicates the presence of Vanaspati. Some sweet sellers are using oil instead of ghee in making sweets. The oil used for making sweets is not harmful unless is adulterated with castor oil. The edible oil can be checked by taking two ml of edible oil in a test tube and dissolving it in petroleum Ether and cool in an ice salt mixture. The presence of turbidity within 5 min shows added castor oil.

Cane sugar is also added as an adulterant in milk curd, and can be detected easily by adding 0.1gm resorcinol and 1ml of conc. HCL to 10 ml of sample and boil it. The appearance of rose red color indicates adulteration. Chalk powder and lime powder are used as an adulterant in wheat flour and besan. Treat the flour (5gm) with

hot dilute HCL. The bubbling of gas indicates carbon dioxide from chalk or other carbonates. Urea in milk can be tested by taking some in a container and adding half a teaspoon of arhar/soybean powder to it. Shake the content thoroughly and leave aside for 5 min. Now, dip red litmus paper in it if the color change to blue, urea is present. Synthetic milk can be felt when rubbed between palms or turn yellow in a pan upon heating

The pure paneer is soft and can bear pressure but panir made up of milk with adulterated baking soda will break into small pieces. The formalin is added to increase the shelf life of milk. It can be easily detected by adding 5 ml of concentrated H₂SO₄ to boiling milk from the sides of the container. The presence of a violet ring at the intersection of two liquids shows adulteration

of formalin. The presence of coal tar dye can be easily detected by the addition of 5 ml concentrated HCL/H₂SO₄ in melted ghee. The presence of a crimson color(HCL) or pink color(H₂SO₄) in the acid layer indicates adulteration of coal tar dye. Lung, bladder, kidney, and digestive tract cancer are related to the consumption of coal tar dye.

The adulteration can be in form of synthetic color synthetic flavor and synthetic sweeteners etc which are not permitted under safety regulations prescribed in FSSAI, 2006. Some harmful chemicals like mercury sulphite, copper sulphate, Aluminium bromide, chromium iodide, and lead oxide are present in synthetic banned colors. These colors are harmful to health and can cause different types of cancer and nervous disorders. The permitted color by FSSAI are Erythrosine, tartrazine, sunset yellow, indigo carmine, caramel annatto, etc and non-permitted are Rhodamine, malachite green, auramine, coal tar dye, etc. Local sweet Vander is either not aware of these harmful color or use them because these are cheaper than permitted one. FSSAI and Agmark also gave some easy methods to detect these banned colors and other adulterants at home. These tests are present on their respective websites. The adulteration is a slow poison that results in bigger diseases in later stages. So before purchasing sweets adulteration should be kept in mind.

Importance of Hygiene in the Dairy Industry



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As the food production chain becomes increasingly complex today, unhygienic work conditions and risks of contamination continue to plague the industry. Milk is one component that has a poor shelf life and is most susceptible to adulteration and growth of microbes if proper hygiene practices are not maintained. The dairy products intended for human consumption must be free from harmful pathogens such as Salmonella, Campylobacter jejuni, Listeria monocytogenes, Yersinia enterocolitica, etc. These microbes can cause serious ailments, particularly in elderly, pregnant women, children and individuals who are immuno-compromised.

The contamination of dairy products can occur via various sources such as unhygienic production & storage processes, handlers and equipment, environment, and packaging materials. To avert the risks associated with poor standards of food safety prevalent in the dairy industry, it has become imperative for dairy farms and production units to stay compliant with GMP, GHP and HACCP guidelines.

Importance of Maintaining Good Hygiene in Dairy Plants

Milk is a perishable food product and easily falls prey to microbial contamination & increased pH levels. This causes dairy products to diminish in quality and taste if proper hygiene measures are not taken in manufacturing and storage conditions.

Maintaining good hygiene is crucial for the dairy industry to:

- Minimize or prevent contamination caused due to entry of pathogens and bacteria from unhygienic milking procedures, equipment, milk contact surfaces, handlers, storage or packaging conditions
- Ensure highest standards of food safety and improved compliance with regulatory practices defined for the dairy industry

- Provide only highest quality and safe dairy products for end consumers.

Key Hygiene Practices for the Dairy Industry

Following are the important guidelines to maintain high levels of hygiene across all steps of dairy production.

1. Milk Production Hygiene

Cutting-edge automated milk production techniques are fast replacing manual milking processes in top-notch dairy farms. However, proper hygiene training should be imparted to everyone involved in the milking process because the two primary contamination sources here are equipment used and handlers.

- Uphold superior hygiene standards in the milking process through the use of modern equipment and advanced milking monitoring measures.
- Prevent contamination through mastitis by proper use of the milking machinery and avoiding over milking.
- In-depth training is important to help maintain highest levels of personnel hygiene.

2. Dairy Plant Hygiene

Effective cleaning and sanitization play an integral role in preserving mandatory hygiene measures in dairy processing plants. Plant hygiene typically comprises of three segments – Processing hygiene, Equipment hygiene and Personnel hygiene.

- Lack of knowledge pertaining to equipment handling or functioning of machineries is one of the key reasons causing bacterial contamination in milk and other dairy products. To prevent this, it is crucial to impart proper training and ensure routine monitoring of the equipments' working performance. Lubricant contamination should also be prevented.
- Not adhering to equipment cleaning



& sanitization standards can also result into contamination through harmful substances such as milk residues, allergens, microorganisms or chemical residues. Therefore, comprehensive cleaning and sterilization of equipment should be undertaken after milk processing.

- Only non-corrosive, industry-approved detergents and disinfectants should be used.
- Maintain optimal drainage system in the processing area and ensure abundant water supply for effective cleaning.
- Using automatic can washer can help prevent milk surface contamination.
- The plant floor should be built from Kota or Mandara tiles, while the dock should be covered with Iron Grid tiles. Ensure regular scrubbing and cleaning of the floor for optimum hygiene.
- Maintaining good personal hygiene is also important to produce high-quality, contaminant-free dairy products. People working in the plant unit should enclose themselves in clean & sterilized work wear, including face masks, hair caps and gloves. Reinforced safety boots or shoes should also be used.
- Refrain wearing jewellery or cosmetics inside the production facility.

3. Personnel Hygiene

Do you know that human beings are the biggest source of dirt, dust and contamination in a dairy plant, affecting



quality & safety of the final product? Keeping this mind, modern dairy farms and production plants should implement stringent personnel hygiene guidelines as mentioned here with:

- Thoroughly wash hands using a high-quality disinfectant or hand-care product before and after leaving the milk processing or production unit. Every time the hands become soiled, they should be cleaned properly before getting back to the work area. Finger nails should be cut short and clean. Do not use performed hand soaps or lotions. Hands must be properly sanitised for critical production areas.
- Any cut or open sore must be reported to the medical centre and covered by a band-aid type coloured dressing.
- Implement use of hygienic and sterilised clothing in dairy plant to prevent product contamination. The workwear should not be worn when away from the production facility or

into the toilet, smoking room or canteen. Proper design of hygiene clothing is essential to prevent the skin from coming into contact with the products.

- Wearing hand gloves is mandatory when handling or packaging the dairy products. Feet should be properly covered with high-quality, disposable shoe caps.
- Dairy plants should also give utmost importance to effective workwear laundry. State-of-the-art laundry facility and compliance with highest standards of hygiene is vital for safe, sanitised and reusable clothing.

4. Dairy Waste Water Hygiene

Lack of proper measures to manage dairy waste water is a primary cause of unhygienic work conditions and spreading of contaminants through various sources. At the same time, most dairy farms and production plants do not have sufficient supply of clean & impurity-free water for rigorous cleaning and sanitization purposes. To maintain proper hygiene and stay compliant to regulatory standards, it is important for dairy plants to implement effective measures for treating dairy waste water. Some of these methods are Aerobic Treatment, Biological Filtration and Activated Sludge.

Conclusion

Hygiene is one of the key parameters ensuring quality and credibility of any dairy farm or production facility. To comply with industry best practices and ensure highest levels of food safety to end consumers, it is imperative to maintain key hygiene standards and monitor performance.



Processing Technologies for Improving the Nutritional Value of Dairy Products



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Introduction

Milk is widely considered most perfect food because of its balanced availability of protein, fat, carbohydrates, vitamins, and minerals, and its high content of essential nutrients such as calcium, essential amino acids, and essential fatty acids. Concentrating these nutrients through processing further enhances the nutritional value of milk and its by-products. For example, the cheese-making process concentrates the protein and fat, reduces the water, and eliminates the carbohydrate component. The whey derived from cheese making can be further processed through a technique called ultrafiltration to concentrate the alpha-lactalbumin and beta-lactoglobulin, proteins of high nutritional value.

Altering the carbohydrates in dairy products

Lactose is the primary carbohydrate in milk. Many dairy products (for example, yogurt and sour cream) are manufactured via fermentative processes that reduce lactose and can be consumed by lactose tolerant people. In these cases, the fermentative process converts the lactose to lactic acid, an element digestible by almost everyone. In addition, yogurt has been shown to contain an inactive form of lactase (the enzyme which breaks down lactose), which is activated in the neutral pH environment of the small intestine (Kolars et al., 1984).

Altering the fat in dairy products

Milk fat is a rich source of essential fatty acids and possesses a uniquely pleasing flavor found in no other fat. It contains a higher proportion of short-chain fatty acids than other fats, which contributes to its ease of digestibility. But in the negative side, its high melting range makes butter chilled to below 15°C hard to spread and unsuitable for use bakery products. If the dairy industry is to achieve any success in utilizing its abundant milk fat, technological modifications will have to be undertaken to improve milk fat's utility as a food ingredient of choice. In terms of surplus butter fat, it would be both practical and profitable to extract butter flavor and concentrate it. This product could then be used in pastries, cooking oils, breads, edible creams, and imitation dairy products (Kinsella, 1975).

Altering the cholesterol in dairy products

The concentration of cholesterol in bovine milk ranges from 10 to 15 mg/100 ml. In milk, 95 percent of the cholesterol in milk was unesterified; the remainder was esterified to long-chain, usually saturated, fatty acids. A hypothesis exists that the cholesterol reeducates from Eubacterium species can be used to convert the cholesterol in fluid milk to products that are either poorly absorbed or completely unabsorbed in the human intestine and that will therefore be excreted. Furthermore, a lesser amount of

(Milk, Butter, Ghee & Paneer)

Plant Business Plan

Soaring Demand for A2 Milk Products for Its High Nutritional Value.



A2 Cow Milk Processing (Milk, Butter, Ghee & Paneer) Plant Business Plan. Soaring Demand for A2 Milk Products for Its High Nutritional Value.





cholesterol would be available in the intestine for oxidation to compounds that are potentially carcinogenic. Products from the chemical reduction of cholesterol are not carcinogenic. Conversion of cholesterol to chemically reduced and poorly absorbed compounds should therefore decrease the concerns of cholesterol-conscious people about consuming milk and other dairy products.

Supercritical fluid extraction (SFE) is a state-of-the-art unit operation that exploits the dissolving power of supercritical fluids at temperatures and pressures above their critical values. It involves the use of a gas elevated above its critical pressure and temperature as a solvent for selected components of a solid or liquid mixture. Under supercritical conditions, the solvent displays an increase in density, approaching that of a liquid, but retains the diffusivity associated with a gas. These properties allow a supercritical fluid to penetrate the structure of a material to be separated, dissolve soluble components, and carry them out of the extraction vessel. The extract can be easily recovered from the solvent by manipulation of pressure and/or temperature conditions such that they become insoluble and precipitate out of solution. The solvent can be vented off or recalculated through the extraction vessel. A number of advantages have been cited for SFE compared with conventional extraction techniques currently used in the food industry. These include reduced energy costs, higher yields, better quality products owing to lower operating temperatures, and elimination of explosive or toxic solvents. It is anticipated that the use of

supercritical fluid extraction and its range of applications will continue to grow during the coming years.

To effectively remove the cholesterol from the milk lipid system, the fat globule must be penetrated, since it contains the largest deposit of cholesterol in milk. However, the cholesterol must be removed from the fat globule without destroying any of the globule's ability to function. Therefore, a crucial factor affecting the ability of the supercritical fluid to extract the lipids from the fat globule is the status of the fat globular membrane.

Altering the trace elements in dairy products

Unfortified milks and formulas are poor sources of iron. However, the percentage of iron absorbed by infants varies widely with the source. About 50 percent of the iron in breast milk is absorbed compared to 10 to 12 percent for cow's milk or formula (Dallman et al., 1980). Fortification of cow's milk with iron sulfate or iron gluconate increases the total iron assimilated. Prolonged breast-feeding protects against iron deficiency; fortified cow's milk or infant formulas are also effective. The total amount of iron absorbed from fortified cow's milk can be four times that absorbed from breast milk.

Fortification must use chelated forms of the metals to ensure initial transfer to the phosphoserine groups of casein; this ligandexchange reaction removes the metals from the reactive environment of milk lipids and ensures more effective utilization. The opportunity to fortify it with several essential trace element gives us the chance to make it even more

nourishing, particularly for infants, children, adolescents, and pregnant women who are at risk of iron and other trace metal deficiencies.

Ultrafiltration

Ultrafiltration is a high-pressure microfiltration process that selectively segregates components of various molecular weights. For milk processing, membranes with varying pore sizes are used to retain the fat and protein while allowing the lactose, water, and salts to pass through. Examples include the concentration of whey proteins, the manufacture of cheese base for processing, and the concentration of total milk proteins and fat for the manufacture of all cheese varieties.

The application of heat during milk or product processing can be helpful or harmful. On one hand, heating reduces microbial loads and eliminates pathogens; it also denatures milk proteins to create specific properties, such as the melting of components in cheese processing to create a homogeneous mass. On the other hand, heating destroys, through protein denaturation, valuable components such as immunoglobulins, enzymes such as lactoperoxidase, and vitamin activity.

Multiple processing techniques can be applied to prevent or reduce the destructive effects of heat. For instance, in dealing with a heat-sensitive element for which preservation is necessary, such techniques can be used as freeze-drying, freeze concentration, ultrafiltration, or reverse osmosis; or microfiltration or irradiation. Simply reducing heat to reduce bacterial loads can also be effective; of course, the heat level must be high enough to eliminate pathogens but not so high as to affect the desired elements.

Conclusions

By processing of dairy milk it will improve the nutritional value of milk and quality of bi-product by preventing the spreading of fat. It also increase digestibility and supports gut microbial flora with better absorption. Thereafter it all improves the health of consumers by consuming the processed dairy milk product. By product is also a solution for lactose intolerance peoples. If any dairy form makes many byproducts from milk then the demand will increase and also helpful for increase of farmers income.

Impact of Climate Change on Livestock

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Introduction

Global warming is the long-term warming of the Earth's climate due to human activities, primarily the burning of fossil fuels, which increases levels of heat-trapping greenhouse gases in the Earth's atmosphere. The term "Global warming" is often used synonymously with "climate change". Climate change is a long-term change in average weather patterns that determine the Earth's local, regional, and global climate. It is most commonly measured as the average increase in global surface temperature on Earth. The effects of climate change (global warming) can be observed on the health, welfare, production, and reproduction of livestock. Global warming is increasing, thereby, threatening ecosystems, animal biodiversity, and food security. Farm animals make a significant contribution to global food security, their contribution is particularly important in the developing world where they represent a crucial source of energy, protein, and micronutrients. Climate change is having a significant impact on the ecosystems and natural resources on which livestock farming depends. At the same time, livestock farming contributes substantially to greenhouse gas emissions and climate change. Climate change affects livestock directly through heat stress and increased morbidity and mortality, and indirectly through the quality and availability of forage and animal diseases.

Effects of climate change on animal production

Agriculture is the main source of livelihood for one third of the world's population. About sixty percent of people who make a living from agriculture own livestock, making animal husbandry a rapidly growing sector. It accounts for forty percent of global agricultural gross domestic product and is crucial for food security in all regions. Farm animals make an important contribution to the global calorie, protein, and micronutrients such as

vitamin B12, iron, and calcium, which is evident from the fact that they produce seventeen percent of the calories consumed worldwide and thirty-three percent of the protein. Furthermore, livestock can increase the world's edible protein balance by converting inedible protein found in the forage into the forms that humans can digest.

In addition, livestock is a key asset for rural communities, providing a range of essential services including savings, credit, and buffering against climate shocks and other agricultural crises. They also provide transport and traction power for field operations. Climate change poses serious threat as rising temperatures, shifts in precipitation distribution, increased frequency of occurrence of extreme weather events, and consequently increased heat stress, as well as reduced water availability have both direct and indirect adverse effects on livestock production and productivity.

- **The direct impact of climate change**
 - I. On grazing system
 - Increased frequency of extreme weather events
 - Increased frequency and magnitude of droughts and floods
 - Productivity losses resulting from physiological stress due to higher temperatures
 - Changes in water availability, may increase or decrease depending upon the region
 - ii. On non-grazing system
 - Increased frequency of extreme weather events, with the impact being less acute than for extensive systems
 - Changes in water availability, may increase or decrease depending upon the region
- **The direct impact of climate change: Agroecological and ecosystem shift leading to**
 - I. On grazing system

- Alteration in food quality and quantity
- Change in host-pathogen interaction resulting in an increased incidence of emerging diseases
- Disease epidemics

ii. On non-grazing system

- Increased resource price (feed, water, and energy)
- Disease epidemics
- The increased cost of animal housing (cooling system)

The vulnerability of livestock to climate shocks depends on their exposure, which is determined by the duration, frequency, and severity of the shock and the location of the herd and associated assets (feedstock, housing, water points). It also depends on their sensitivity, which is determined by the breed. Socioeconomic factors that have a particular impact on disease prevalence include changes in land-use patterns, host abundance, international trade, mitigation, and public health policies.

These environmental conditions can affect livestock health by causing metabolic disorders, oxidative stress, and immunosuppression, leading to infection and death. Hot summer conditions disrupt multiple reproductive processes, resulting in a marked reduction in conception rates in dairy animals worldwide. When body temperature reaches 39.5 °C, severe impairment of reproductive processes such as impaired oocyte viability, weakened embryonic growth, and early embryonic death due to impaired hormone secretion, change in growth dynamics of ovarian follicles, suboptimal development of the corpus luteum, and weakened uterine endometrial responses may occur.

Applying efficient cooling is a must, and a requirement to minimize heat stress. However, sometimes reducing summer heat stress alone is not enough to maintain reproductive function, even after the stressor ends. So, it is recommended to combine cooling with other treatments to improve fertility. In particular, treatments to improve the timing of ovulation, increased removal of impaired follicles, induction of ovulation from healthy follicles, embryo transfer, and progesterone supplementation before and after artificial insemination may be

required to improve fertility in heat-stressed dairy cows. Heat stress also has a negative effect on milk and meat production, with not only the quantity but also the quality of animal products being strongly and negatively affected by a hot environment.

Effects of climate change on animal health

Infectious diseases and their transmission cycles represent complex interactions between hosts, pathogens, and the environment. These occur mainly due to changes in the host-pathogen environment. Among these, most diseases are zoonotic; meaning that they are transmitted from animals to humans and have serious consequences for public health, affecting the economy of the livestock sector and biodiversity conservation.

Climate change, and particularly global warming, affects animal health by affecting the interaction between host, pathogen, and the environment both directly and indirectly. The direct effects are more likely to affect diseases related to vector transmission, water or food, soil, rodents, air temperature, and humidity. The indirect impacts of climate change are more complex and include those arising from changes in land use and biodiversity, animal's attempts to adapt to these climatic changes or the impact of climate on microbial populations, distribution of vector-borne diseases, and the host's resistance to infectious agents or food-borne diseases. Climate variability in rainfall, temperature, humidity pattern, and extreme weather events such as floods, drought, and heatwaves are important indicators for monitoring and predicting the occurrence of animal diseases.

Impact of livestock farming on climate change

The livestock sector is a major contributor to climate change, generating significant emissions of greenhouse gases (carbon dioxide, methane, and nitrous oxide). Livestock contributes to climate change by emitting greenhouse gases either directly (through enteric fermentation and manure management) or indirectly (feed production, conversion of forests to pastures).

For the past quarter-century, the livestock sector has focused on improving productivity, regulating the micro-environment of the animal, and improving

nutritional management rather than improving stress resilience. This approach dramatically increased the productivity of these animals but also increased their sensitivity to hot environments. The processes by which domestic animals respond to changes in their environment are critical to survival but often negatively impact the productivity and profitability of livestock systems. Acclimation and acclimatization are coordinated phenotypic responses to environmental stressors and the response will decay if the stressors are removed. If chronic stress persists over several generations, the acclimatization response will become genetically "fixed" and the animal will be adapted to the environment.

It is well known that the selection of animals for high production levels has increased the animals' vulnerability to environmental problems. On the other hand, using lower-performing cows could reduce heat stress, but reduced production efficiency can lead to increased greenhouse gas intensity. While a single stressor can be important, the cumulative effects of multiple stressors (in addition to heat stress) can be significant and must be considered. Adaptation strategies include production system adjustments and genetic improvement in thermotolerance. In addition to adaptation, mitigation strategies should also be discussed, these include changes in animal husbandry systems (nutritional interventions, manipulation of the rumen ecosystem, provision of shade, housing, fans, and sprinklers). Multidisciplinary approaches including animal husbandry, nutrition, housing, and health are needed to reduce the adverse impacts of climate change on livestock.

Therefore, the implementation of mitigation strategies aimed at reducing emissions from the livestock sector is the need of the hour to limit the environmental burden from food production while ensuring a sufficient supply of food for a growing world population. Mitigation can be done directly by reducing the amount of greenhouse gases emitted or indirectly by improving production efficiency. To increase the effectiveness of these strategies, the complex interactions between the components of animal production systems must be considered to avoid ecological trade-offs'.

Role of Micronutrients in Livestock Reproduction



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Introduction

Micronutrients are one of the major groups of nutrients essential for the body. They are vitamins and minerals in minute amount. For proper functioning of animals body, in addition to protein, fat and carbohydrate, minerals and vitamins are also required in smaller amount to prevent deficiency disease in animals. Among indispensable nutrients, significant role is played by macro (calcium and phosphorus) and micro-elements (Copper, zinc, iron, cobalt, manganese, iodine and selenium), either independently or collectively in reproduction of farm animals. However vitamins deficiencies are unlikely to occur in most dairy herds. Except vitamin A, as the requirement of all other vitamin frequently met by a combination of rumen and tissue synthesis and from natural feeds. The only vitamins shown to be involved in reproduction of farm animals are vitamin A, D and E.

Copper

It is necessary for normal connective tissue maturation and normal hemoglobin and red blood cell developments. High levels of molybdenum, sulfur, iron or zinc in the diet interfere with normal copper absorption and metabolism. Copper deficient diet delayed onset of puberty, repeat breeding, low conception, early embryonic mortality and increased incidence of retention of placenta. In male copper deficiency leads to decrease libido, lower semen quality, and severe damage of testicular tissue may render the bull sterile.

The fertility can be restored on supplementation of 10 g copper sulphate & 2 g cobalt sulphate daily for a period of 3 weeks.

Cobalt

It is essential for microbial synthesis of vitamin B12 in ruminants. The requirements of cobalt is higher when cattle are fed high grain diets, because more vitamin B12 is required to metabolize the end products of rumen fermentation. The clinical signs of cobalt deficiency are delay in onset of puberty, anemia, general unthriftiness, delayed uterine involution and decrease conception rate and could be corrected by supplementation of 20-25 mg

cobalt sulphate or chloride / 100 kg body weight.

Iodine

It's important for growth, reproductive performance and lactation in farm animals. Adequately dietary daily intake of iodine is therefore of considerable importance. Iodine is required for synthesis of the thyroid hormones (T3 and T4). Signs of iodine deficiency related to reproduction include delayed puberty, cessation of estrus activity and an ovulatory estrus periods. When an iodine-deficient diet is fed during pregnancy, cow may deliver weak or dead, hairless calves. Cow may also abort and have an increased incidence of retained placenta and calves may be born with goiter. In iodine deficient areas, favorable results have been reported in repeat breeding cows by feeding of 20-40mg of an organic iodine preparation daily from 8-18 days before the onset of estrous.

Manganese

Manganese levels in forage vary considerably, depending on the soils on which they are grown. Manganese actively participate in redox processes, tissue respiration and bone formation and affects growth and reproduction.

Its required for activation of many enzyme systems and may be involved in luteal tissue metabolism. A deficiency has been reported to result in silent estrus, infertility, abortion, and birth of calves with deformed or twisted legs. Absence of libido and failure of spermatogenesis in male animals are very common. In cystic cows, low level on manganese has been reported in ovarian tissue than normal cows. Since granulosa cells of ovary require manganese for follicular development, its deficiency might lead to degeneration of granulosa cells.

Zinc

Zinc is required for various enzyme as a cofactor related to reproduction. Deficiency of zinc may leads to make infertility and to the reduction of size of testes. Zn deficiency can adversely affect the spermatogenesis, testicular growth and the development of primary and secondary sex organs in male and all phase



of reproductive process in females from estrus to parturition to lactation. Zinc has a significant role in repair the maintenance of uterine lining following parturition and early return of post partum estrus. Zn deficient animals have been shown have lower concentration of FSH and LH chiefly in males. Zn deficiency in male cause atrophy of seminiferous tubules and inefficient testicular development in young ones, leading to reduced testicular size, lack of libido and can adversely affect spermatogenesis.

Iron

Since most forage contains high levels of iron and because substantial amount of soil are consumed during grazing, iron is almost never deficient in cattle fed forage-based diets. In case of animals having diet deficient in iron the animals suffer from deficiency disease. The most common symptoms of iron deficiency is microcytic and hypochromic anemia. A more common problem with iron is that it may be excessively high in forage or in drinking water, which can interfere with the absorption of copper and zinc.

Selenium

It is an integral component of the glutathione peroxidase enzyme. The marginal selenium deficiency can result in retained placenta, impaired fertility, silent heats and unthrifty weak calves with poor immune response and reduced sperm motility in males. Feeding most common types of rations, especially legumes will prevent these deficiencies. Although selenium deficiency is sporadic but it impairs the reproduction.

Vitamins

Though required in minute amount as compared to protein, carbohydrates and fats but vitamins play a significant role in animal health, production and reproduction. Fat soluble vitamins like A, D and E has special significance in reproduction of farm animal.

Vitamin A

This is available in most green plants, and if the animals graze on well managed pastures and forage, deficiencies will not occur. However, cattle fed on poor quality roughage, such as poor quality hay and straw, require supplementation. Vitamin A deficiency adversely affects reproduction in most species and effects are manifested during the later half of gestation. Which are characterized by birth of weak and dead calves. Vitamin A deficient animals have

normal estrous cycle, ovulate and conceive, early fetal development occur even though epithelial and other tissue changes have developed. The clinical signs associated with vitamin A deficiency in cattle include delayed onset of puberty, abortion or birth of weak, blind, in-cordinated calves, suppressed libido in male. Diets deficient in β -carotene but adequate in vitamin A have been shown to cause delayed ovulation, silent estrous, extended follicular phase, anovulation and delayed involution of uterus.

Vitamin D

There is little vitamin D in plants. Animals obtain most of it from the sun. Vitamin D is necessary for the absorption of calcium and phosphorous from the intestines and the deposition of the minerals in bone as well as in the maintenance of normal blood levels. Vitamin D deficiency in young calves is likely to occur when they are housed in dim lights and offered poor quality diets. Vitamin D deficient pregnant cows produce calves with rickets, whereas non-pregnant cows fail to exhibit estrous cycles.

Vitamin E

It's a potent antioxidant compound that protects the cell membranes. Moreover, when combined with vitamin C, it has shown even stronger antioxidant properties. Effect of vitamin E occurs directly or indirectly on the regulation of intra-testicular factors which regulate specific steps of germ cell development. The other aspects that is its reproductive function is associated with selenium. Parturition supplementation of vitamin E reduces the recurrence of retained fetal membrane.

Cause of mineral deficiency

Presence or absence of particular mineral

nutrients in animals feed in specific geographical area depend on the farming practices. Heavy application of nitrogen fertilizer reduced in the concentration of various micro minerals (copper, cobalt, molybdenum and manganese) content in the pasture, likewise lime application reduce plant copper, cobalt, zinc and manganese levels and increase in the molybdenum content. In tropical regions marked leaching and weathering of soils under conditions of heavy rainfall and high temperatures make the deficient in plant minerals. Increasing crop yields remove minerals from the soil at a faster rate so deficiencies are frequently found on the most progressive farms. Even though a diet may contain adequate amounts of particular nutrients, other factors decrease the absorption of that nutrient, thus reducing the value of the dietary supplements. High levels of phosphorus reduce zinc and, to a lesser degree, calcium uptake. It is antagonistic to boron in low pH soils. High levels of copper can accentuate molybdenum and to a lesser degree iron, manganese and zinc deficiency. Iron deficiency can be accentuated by liming, low potassium levels or high levels of copper, manganese or zinc. Uptake can be decreased by high phosphorus levels, liming or high levels of copper, iron or manganese. Zinc deficiencies are often associated with manganese deficiencies.

So mineral imbalance (excesses or deficiencies) in soils and pasture may be responsible for low production and reproduction problems among grazing animals in the tropics. Thus, it is necessary to provide these elements as dietary supplements to promote efficient and profitable livestock production and reproduction.

Table- Dietary allowances of minerals (mg/kg DM) and vitamin (IU) for adult cow

Micronutrients	Dose
Vitamin A	28000 IU
Vitamin D	2400 IU
Vitamin E	195 IU
copper	12
Iron	40
Iodine	Winter- 0.5 Summer- 0.15
cobalt	0.3
Selenium	0.3
Zinc	40
Manganese	40

अब खेती हुई आसान



Available on the
Google Play

Download on the
App Store

FAARMS – An Amazon for the Farming Community



AlokDuggal and Taranbir Singh both former bankers joined hands to start an interactive digital Agri platform FAARMS - an Amazon for the farming community in January 2020. The objective is to offer a one-stop solution by providing a complete range of products and services to farmers at their doorstep. FAARMS stands for

F - Farmer ecosystem for

A - Agriculture

A - Automation

R - Rural enablement

M - Modernization and

S - Social Inclusion

It provides farming inputs right from seeds, bio fertilizers, agro chemicals, animal feed, agri equipment & implements to advisory, insurance, and banking services. More than 2000 + products from leading national and international brands such as Bayer, Godrej Agrovvet, Deheus and many more are available directly from the manufacturers.

This is further supported by Faarms TV a virtual knowledge-exchange platform that showcases best practices related to farming and agri allied activities such as dairy and poultry, based on the guidance & expertise of agri scientists and progressive farmers. The platform offers multilingual videos covering a wide range of topics related to agricultural products and practices. Users can download the app or login to YouTube and get farming related knowledge all in one place.

Relationship Managers, graduates from agricultural universities visit dairy and crop farmers for health checkup of cattle and crops and advising farmers on the betterment of both.



Country's premier Agriculture research centres, Dairy Cooperatives and Central Warehousing Corporations (CWC), have recognized the work Faarmsis delivering on the ground and have come forward to associate with them. They have signed an MoU with Central Warehousing Corporation(CWC) to have access to 422 warehouses across India to help the company deliver to the farmers in the interior's parts on time.

FAARMS today is on a mission to double the income of the farmers by 2024. It is already working with more than 70000 farmers in 80 clusters in Punjab, Haryana, UP, Uttarakhand, Rajasthan, Gujrat& MP.

Faarms has also partnered with Bharat BillPay to create a marketplace for farmers across India to manage recurring payments such as water, gas and electricity bills, loan repayments, insurance premium payments, and secure products such as seeds, cattle feeds, and farming equipment delivered directly to their doorstep utilizing the Faarms-owned and operated logistics network.

Faarms has raised \$10 million in recent funding round led by investors including Cornelius (Conny) Boersch, Founder of Conny& Co., a serial entrepreneur, Singaporean angel investor Koh Boon Hwee, along with ApoorvaRanjan Sharma - co founder of Venture Catalyst and 9 Unicorns and Ramit Mittal of Bharti Family, as well as other Indian and international investors. The funds will be used upgrade technological infrastructure, to expand its outreach across the country and scale up their supply and distribution channels.



अब किसानों को मिले अपना मनचाहा सामान,
अपनी मनचाही जगह ।





Finar Foundation – Providing Education – The Soul of The Society



The belief that education improves personal lives and helps the society to run smoothly, it makes children capable to find solutions to their problems & achieve success in life has led Finar Foundation to start specially designed initiatives focused on students of government primary schools to create an environment for the children to gain practical knowledge thru different means. Some of the programs are:

Vidhya Aarambh

With a small ritual school kits are provided to students and they are motivated to come to school regularly.

Innovation Outreach Program

Students are taught about science and mathematics concepts and theories through games and activities. The program was initiated with a support of 'Vikram Sarabhai Community Science Centre'.

Science Fair

A science fair is organized for students of Government Primary Schools every year on 28th February to celebrate "National Science Day".

Science Lab

To support science activities at school level all the required materials, equipment and chemicals are provided to primary schools. In the second stage of the initiative Science Laboratories are being developed in schools for providing knowledge of science subject to the students of rural areas.

Makers Adda

Mr. Sanjay Raval, principal of Chanakya Primary School in Ahmedabad has initiated a project Maker's Adda where a classroom is provided for the students in the school to upgrade the creativity of students. Finar Foundation has provided all the required materials for the Maker's Adda and supported the cause.





Educational Tours

They arrange Educational tours for students to places like ISRO (Indian Space Research Organization), Science City, Vikram Sarabhai Community Science Center and many more educational places.

Laadli

Finar Foundation extends the support and ensures higher education of 10 Laadali's in the far most rural areas, where the caste restrictions refrain a girl child to study further.

Toy Bank

They started the initiative to collect unused toys from the society, repair or refurbish it and provide to underprivileged children on 2nd October 2015. **Vidhya Aarambh**

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NDDB to Donate Rs 1.5 crore Towards About 500 MT of Cattle Feed to Flood Affected Assam



Ahmedabad: The National Dairy Development Board (NDDB) has decided to donate Rs 1.5 crore towards about 500 MT of cattle feed to meet the immediate requirement of animals in flood affected Assam through West Assam Milk Union (WAMUL). NDDB-managed WAMUL is being advised to use their supply network and coordinate with local authorities for seamless distribution of cattle feed.

Shri Meenesh Shah, Chairman, NDDB expressed his solidarity with all those who have suffered loss of life, property and livelihoods. He appreciated the swiftness with which the Govt of Assam under the leadership of Hon'ble CM Dr Himanta Biswa Sarma, responded to the disaster by arranging rescue of stranded people and distributed much-needed relief materials to the affected regions. He specially lauded the launch of a portal for enabling people to register livestock losses due to floods.

Chairman, NDDB said, "The impact of floods in Assam on both humans and livestock is beyond comprehension and a cause of great distress to so many of us even at this distance." This contribution is symbolic of NDDB's deep commitment towards the unfortunate victims of the catastrophe.

BASF expands its world-scale vitamin A formulation plant Ludwigshafen

BASF
We create chemistry

BASF is strengthening its market position in vitamin A by expanding its world-scale formulation capacities at its Verbund site in Ludwigshafen. The state-of-the-art facility, which is fully integrated into vitamin production at the site, will support and further expand the production of high-quality vitamin A powder products for the animal nutrition industry. Start-up is planned for mid-2023 and will stepwise increase BASF's vitamin A powder formulation capacities in line with the increased vitamin A acetate production capacity.

The expansion of the vitamin A acetate plant in Ludwigshafen was successfully completed in 2021, increasing BASF's total annual nameplate capacity for vitamin A acetate to 3,800 metric tons. With the expansion of the formulation plant, BASF is further enhancing its vitamin A production footprint. Close integration of the powder plant facility

into the BASF Verbund will additionally ensure a best-in-class CO2 footprint and an efficient use of resources.

"Our commitment to the vitamin A market remains strong," said Julia Raquet, Senior Vice President of the new global business unit Nutrition Ingredients. "This investment is part of our new operating model, leveraging and further strengthening core product platforms of our nutrition ingredients business. It underlines our ambition to meet market demands for vitamin A in the long term and ensures reliable, high-quality supply to our customers."

BASF is a leading global producer of vitamin A for animal nutrition. With the expansion of the world-scale formulation plant, BASF supports its customers' growth plans and emphasizes the role of vitamin A as a strategic pillar for the animal nutrition business.





Shri Parshottam Rupala Launches NDDB's Manure Management Subsidiary

25 July: Shri Parshottam Rupala, Union Minister of Fisheries, Animal Husbandry and Dairying launched NDDB MRIDA Limited, a wholly-owned subsidiary company of National Dairy Development Board to take forward manure management initiatives across the country in presence of Dr Sanjeev Kumar Balyan, MoS, FAHD and Dr L Murugan, MoS, FAHD. Shri Atul Chaturvedi, Secretary, DAHD, Govt. of India, Shri Meenesh Shah, Chairman, NDDB, Ms Varsha Joshi, Additional Secretary (CDD), DAHD, and Shri Sandeep Bharti, newly appointed Managing Director of NDDB MRIDA Limited.

NDDB has established NDDB MRIDA Limited, an Unlisted Public Limited Company under the Companies Act, 2013 on July 1, 2022 as with the paid-up capital of Rs. 9.50 crore.

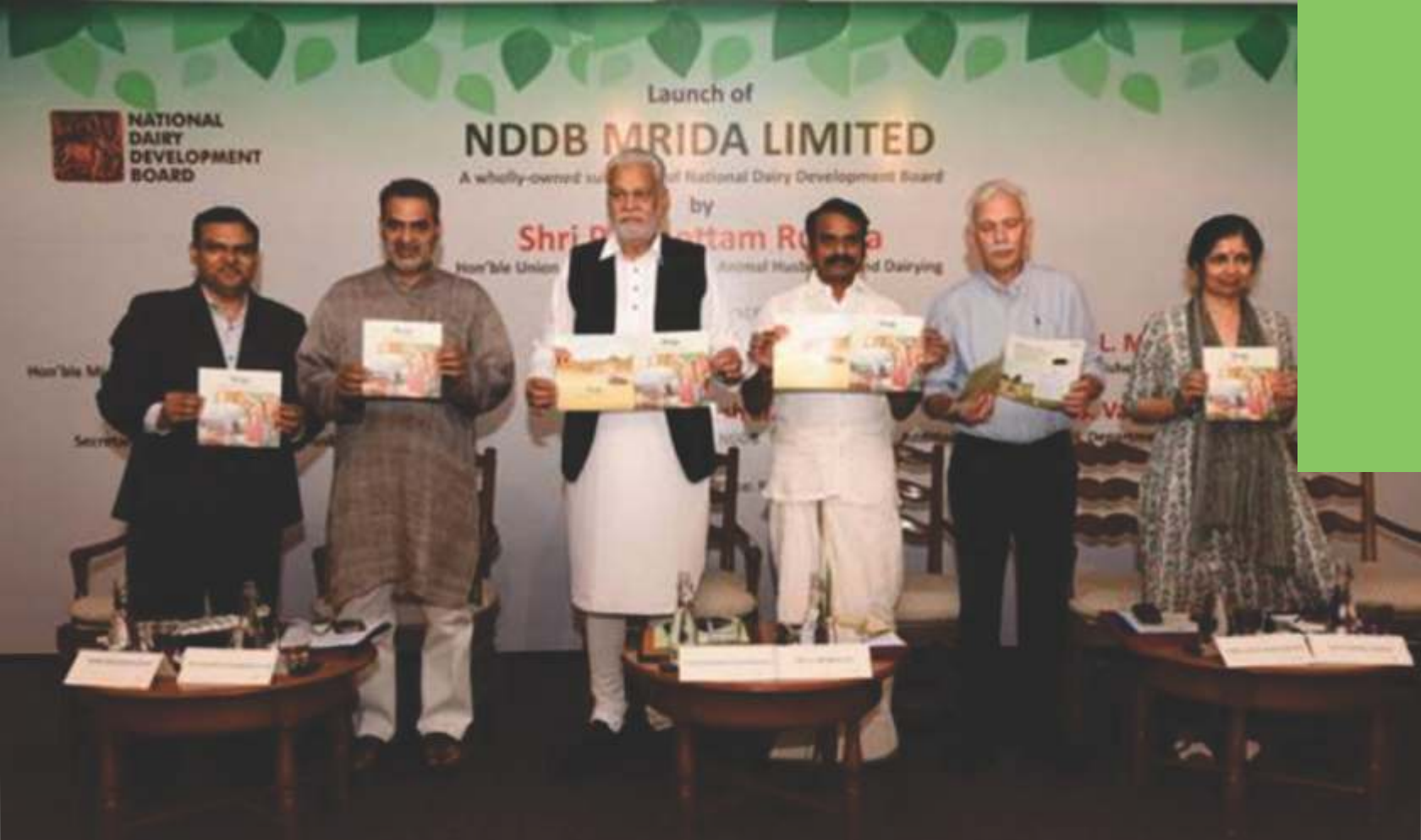
On the occasion, Shri Rupala said NDDB Mrida Ltd will open avenues of additional income to dairy farmers from sale of slurry/ dung. He added

that it will help in savings to the farmers by virtue of replacement of cooking fuel with biogas. He further said that efforts are being made for better utilisation of bovine dung but most are individual initiatives and this new company will provide structured impetus to manure management efforts.

Promoting usage of dung-based manure will gradually lead to replacement of chemical fertilisers with organic manure thereby reducing dependency on India's dependency on imports, said the Union minister.

On this occasion, Dr Balyan launched a brochure on NDDB MRIDA Limited and Dr Murugan handed over NDDB's SUDHAN trademark to Chairman and MD, NDDB MRIDA Limited.

Dr Balyan said this is a first-of-its-kind company focussing on efficient utilisation of dung by creating a manure management value chain which will immensely contribute to



enhancing the livelihoods of dairy farmers and at the same time contribute towards Swachh Bharat Mission and promotion of green energy.

Dr Murugan said the manure management initiatives have potential to generate biogas equivalent to 50 per cent of India's present LPG consumption & also produce bio slurry equivalent to 44 per cent of India's NPK requirement. He added that efficient manure management promotes general well being & cleanliness, contributes to increasing the productive economic life cycle of the milch animals beyond milking thereby helping tackle the problem of stray cattle & lowering of GHG emissions.

Shri Chaturvedi said that NDDB has also taken up projects for utilisation of cattle dung to meet the energy needs of dairy plants. He added that foundation stone for first such project was laid by Hon'ble Prime Minister of India in Varanasi on December 23, 2021. NDDB has also registered a trademark named

"SuDhan" to provide common identity to dung based organic fertilisers.

Shri Shah said NDDB Mrida Ltd will take up setting up of manure value chain, biogas based CNG generation, biogas-based energy generation for dairy plants. He added that the new company will explore opportunities to efficiently use cattle dung as ingredient for various applications in different industries and as a replacement to traditional wood, clay, paint, etc.

Chairman, NDDB and NDDB Mrida

Ltd said the company will undertake research and development on cost effective technologies for efficient dung management and a major area of focus will be establishing revenue generation models at the village-level through sale of cattle dung-based products. He added that the company will provide marketing and sale support to agencies manufacturing gobar-gas slurry-based fertilisers and establish mechanisms to accrue carbon revenue from the projects to generate additional revenue stream for dairy farmers.



Sapience Launches Its Sustainable Animal Health and Nutrition Solutions in Southeast Asia



Fuelled by a growing population and lifestyle changes, Southeast Asia's demand for good-quality proteins is ever-increasing. Soon, this demand will outstrip our current production capacities while increasing our carbon footprint and endangering our food and healthcare infrastructures.

At Sapience, we believe the health of animals, people, and the planet are inextricably linked. We are reimagining protein production through a holistic approach to ensure sustainability, food safety, and food security. Sapience has created an ecosystem where the best research and innovation, supported by world-class manufacturing, converge to provide products, services, and technology on a single platform to our partners. From pioneering Antibiotic Free Performance Enhancers (AFPEs) to promoting hormone-free natural ways to increase milk production, Sapience is at the forefront of ensuring food safety and security for all sustainably and affordably.

Sapience is delighted to announce the launch of our Southeast Asian Division. Headquartered in Bangkok, our division will be instrumental in bringing our advanced sustainable solutions to Thailand, Vietnam, Cambodia, Myanmar, and Laos.

AgNext and Elanco Announce Strategic Alliance to Advance Livestock Sustainability

Elanco Animal Health Inc. is collaborating with AgNext at Colorado State University. They announced a strategic alliance on August 2 as part of their ongoing commitment to pioneer sustainability solutions for animal agriculture, transforming the next frontier of opportunity in livestock sustainability.

Sara Place, Elanco's Chief Sustainability Officer, will join the AgNext team and transition to her new role as associate professor of feedlot systems as part of the strategic alliance.

According to Elanco, the AgNext programme is a first-of-its-kind research collaborative that focuses specifically on animal agriculture sustainability, working with members of the entire value chain to develop innovative, scalable solutions that help move the industry toward a more sustainable future. The programme aims to establish a world-renowned centre of excellence for identifying and scaling innovation that promotes animal and ecosystem health in order to promote profitable industries that support vibrant communities.

"This exciting collaboration with Elanco will help AgNext further our work to develop sustainable solutions for animal agriculture and empower producers and others in the value chain," said Kim Stackhouse-Lawson, Director of AgNext at CSU. "Having Dr. Place's expertise and perspective on the AgNext team will enable our centre of excellence to more quickly identify and scale innovation to advance animal agriculture science."



About Elanco

Elanco Animal Health Incorporated is a global animal health leader committed to innovating and delivering products and services to prevent and treat disease in farm animals and pets, thereby creating value for farmers, pet owners, veterinarians, stakeholders, and society as a whole. With nearly 70 years of animal health experience, the company is dedicated to assisting its customers in improving the health of the animals in their care while also having a positive impact on local and global communities.

Indian Dairy Association Elects RS Sodhi as its New President



R S Sodhi, the managing director of Amul Federation, has been chosen to serve as the new president of the Indian Dairy Association (IDA). A few of the organisations that make up IDA, the leading association for the Indian dairy industry, which was established in 1948, include dairy cooperatives, multinational corporations, corporate entities, private institutions, educational institutions, and government and public sector units.

Sodhi currently sits on the board of the International Dairy Federation in addition to serving as the president of the 18-member dairy company that manufactures milk products under the Amul brand (IDF).

Upon being elected as IDA President, Sodhi said, "It is an honour for me to represent the IDA because Dr. Varghese Kurien, my mentor, held the same post in the year 1964, and now I received the opportunity to head this organisation after 58 years."

Dr. Sodhi has worked for Amul for 40 years and has served as the company's CEO for the past 12 years. It's also important to remember that he was chosen to serve on the International Dairy Federation (IDF) Board the previous year.

Rajesh Fal Dessai is the new chairman of Goa Dairy



For the third time, Rajesh Fal Dessai, chairman of the Somnath Dairy Society in Adane, Quepem, took over as chairman of the Goa State Cooperative Milk Producers' Union, also known as Goa Dairy.

Over three and a half years of the board's previous five-year term were spent under the administrator. During this time, the dairy unit's milk sales and cattle feed production were down, and the chairman has vowed to restore the dairy's "lost glory."

FalDessai stated that he will investigate the issues that have resulted in a drop in milk sales and inconsistency in cow feed production. "The dairy belongs to the farmers, and I will work to ensure their well-being," he said.

Faldessai also stated that everything will be back on track in fifteen days for the smooth operation of Goa Dairy with the support of BoDs, Farmers, and the Goa Government's cooperation.

August 2022

2. Livestock Malaysia

Dates: August 10 - 12, 2022
Venue: MITC Complex
City: Melaka
Country: Malaysia
Email: livestockmalaysiamy@informa.com
Website: www.livestockmalaysia.com

3. Livestock Philippines 2022

Dates: August 24 - 26, 2022
Venue: World Trade Center
City: Pasay city
Country: Philippines
Email: rita.lau@informa.com
Website: www.livestockphilippines.com

September 2022

1. Victam Asia 2022

Dates: September 7 - 9, 2022
Venue: IMPACT Exhibition Center
City: Bangkok
Country: Thailand
Website: www.victamasiasia.com

October 2022

1. World Dairy Expo

Dates: October 2 - 7, 2022
Venue: Alliant Energy Center
City: Madison, Wisconsin
Country: United States
Website: www.worlddairyexpo.com

2. Sommet-elevage, France

Dates: October 4 - 7, 2022
Venue: Grande Halle Showgrounds
City: Ferrand
Country: France
Website: www.sommet-elevage.fr

3. VIETSTOCK 2022

Dates: October 12 - 14, 2022
Venue: Saigon Exhibition & Convention Center (SECC)
City: Ho Chi Minh City
Country: Vietnam
Website: www.vietstock.org

4. The Dairy Expo

@ The Livestock & Agri Expo
Dates: October 28-30, 2022
Venue: India Expo Center & Mart
City: Greater Noida - Delhi
Country: India
Email: info@thedairyexpo.in
Website: www.thedairyexpo.in

November 2022

1. EuroTier

Dates: November 15 - 18, 2022
Venue: Deutsche Messe AG
City: Hannover
Country: Germany
Website: www.eurotier.com

December 2022

1. Agri Livestock 2022

Dates: December 2 - 4, 2022
Venue: Myanmar Expo Hall
City: Yangon
Country: Myanmar
Website: www.agrilivestock.net

Fonterra introduces New Zealand's first electric milk tanker in an effort to reduce emissions.



Fonterra and Dr Megan Woods, Minister of Energy and Resources, celebrated the launch of New Zealand's first electric milk tanker yesterday in Morrinsville. The tanker is a pilot project that, if successful, has the potential to transform the country's heavy transport sector, as road transport is one of the fastest growing sources of emissions.

The government has set an ambitious goal of reducing emissions from freight transport by 35% by 2035, and Fonterra sees tankers as a way to help the country achieve this goal.

The tanker, named Milk-E by one of Fonterra's farmers, was built by the Morrinsville workshop of the co-op.

Fonterra chief operating officer Fraser Whineray stated that Milk-E is part of Fonterra's fleet decarbonisation work because the co-op aspires to be a leader in sustainability.

"Our teams are constantly looking at ways to reduce our emissions - from the farm to our sites and across our transportation network," Whineray said.

"The team at our Morrinsville workshop did an outstanding job putting this tanker together. Milk-E is a New Zealand first, so it took a lot of creative thinking and Kiwi ingenuity to bring it to life."

The tanker will be powered by battery swap technology. One battery takes about three hours to charge and can be swapped out in about six minutes.

It has a range of about 140 kilometres on

a full charge, but this has yet to be tested. This is why Milk-E will be based at Fonterra's Waitoa facility, as the town has many close-by supplying farms on relatively flat land, resulting in shorter runs.

Amul cooperative's group turnover rises 15 % to Rs 61,000 crore

The GCMMF and the unions that make up the federation reported a combined group turnover of Rs 61,000 crore in 2021-22, an increase of Rs 8,000 crore from Rs 53,000 crore in 2020-21.

The Gujarat Cooperative Milk Marketing Federation (GCMMF) reported on Tuesday that the Amul cooperative's group turnover increased by 15% annually to Rs 61,000 crore in 2021-22. GCMMF, which offers products under the Amul brand, states that it reported a revenue of Rs 53,000 crore during the previous fiscal year.

Following the AGM, GCMMF Chairman Shamalbhai Patel reported that the organisation had increased its revenue by 18.46% between 2021 and 2022, exceeding the CAGR of 16% over the previous 12 years. "Our milk procurement has grown by an amazing 180% over the last 12 years. The high milk procurement price that was paid to our farmer-members during this 12-year period, which increased by 143%, was the cause of this remarkable growth.

The chairman continued, "The highly remunerative price helped us keep farmers' interest in milk production, and better returns from dairying have motivated them to increase their investments in this sector."

He stated that the cooperative is growing its fresh product line to include milk, curd, and buttermilk and that it will invest Rs 500 crore to build a new dairy plant in Rajkot, Gujarat. Large dairy plants will also be built in Baghpat, close to Delhi, Varanasi, Rohtak, and Kolkata, within the next two years, according to Patel.

Banas dairy reports

a 1,650-cr price difference for milk producers.

Banas Dairy, the country's largest milk cooperative, announced a record 19.12% price difference for its over five lakh milk-producing members, on top of the price of the milk they were paid for.

The Banaskantha District Cooperative Milk Producers' Union Ltd, popularly known as Banas Dairy, announced at its 54th annual general meeting in Palanpur on Monday that it will distribute over Rs 1,650 crore of the price difference or additional income to its members' bank accounts directly.

The price difference represents additional profit paid to milk producer members above and beyond the price of milk sold. These are earned by selling value-added non-dairy products, and profits are distributed to members at the end of the year as a price difference.

Shankar Chaudhary, chairman of the dairy and a former BJP minister, announced the decision in Palanpur, saying that the amount was Rs1,100 crore last year and has now been increased to over Rs1,650 crore. In his address to the AGM, Chaudhary stated that Banas Dairy has been expanding its operations in various states such as Uttar Pradesh, Jharkhand, and Andhra Pradesh, among others.

"Banas Dairy, with annual revenues of Rs15,255 crore, has brought a white revolution to the Banaskantha district, also known as Sukha pradesh (drought-hit area). We are expanding our operations in Uttar Pradesh, Andhra Pradesh, and Jharkhand, among other states, and we are hiring from Banaras Hindu University, IIT Kanpur, and IIMs" Chaudhary explained.

Banas Dairy is establishing its third manufacturing facility in Prime Minister Narendra Modi's Lok Sabha constituency of Varanasi. Their two plants in Lucknow and Kanpur are already operational. The dairy, headquartered in Palanpur, is well-known for some of its individual milk producers, including women who have made headlines for selling milk worth more than Rs1 crore per year.

Milkfed intends to enter the Delhi market with Verka products.

Punjab State Cooperative Milk Producers Federation Limited, also known as Milkfed, plans to launch its Verka brand of milk and milk products in a big way in the national capital. Milkfed already sells 30,000 litres of milk per day in Delhi and hopes to expand into the government sector, such as schools, childcare centres, and government-run hospitals.

"We see a huge scope in this sector. We have mooted a proposal before Delhi's cooperation minister and we are hopeful of a positive development on this front," said a Milkfed officer not willing to be named, as according to him the proposal was at a "very premature stage".

The Delhi government has reportedly asked Milkfed to approach it through the tendering process, as other milk-supply companies have, but the federation prefers to reach an agreement through rate negotiations. With the Aam Aadmi Party (AAP) in power in both Punjab and Delhi, the federation is optimistic about reaching an agreement.

With 7,000 milk collection centres linked to 11 district-level cooperative milk unions, Milkfed has a strong network throughout Punjab. However, in the national capital, it faces stiff competition from other strong brands such as Amul and Mother Dairy. Milkfed management believes that a drastic rate cut is not possible because the federation operates on a "no profit, no loss" basis, and factors such as milk being a perishable commodity and Delhi being approximately 250 kilometres from the state capital must be taken into account.

Milkfed processes 21 lakh litres of milk per day on average, and there is still enormous potential as dairy farmers in the state produce 210 litres of milk per day. "The daily quantities fluctuate, but the yearly average equals this." "There is a massive surplus of milk because we only process 10% of what is available," said the officer cited earlier.

DeHaat signs MoU with SFAC (Small Farmers' Agri-Business Consortium) today at SFAC's headquarters in Delhi!



DeHaat has taken another important step toward improving farmers' livelihoods by collaborating with SFAC. Our Co-founder and CEO Shashank Kumar, Vice President, New Initiatives (DeHaat)- Dr Dinesh Chauhan (PhD), and Dr Vijaya Lakshmi Nadendla, IAS, Managing Director, SFAC signed the MoU.

This step was taken with the goal of supporting special category "Value-Chain FPOs." DeHaat will be solely responsible for the formation and promotion of these Value-Chain FPOs across India. This initiative will improve agricultural dynamics in the country by increasing market linkages for farmers across the country.

Faarms, a rural-tech firm, raises \$10 million in a funding round

BENGALURU: Faarms, a Bengaluru-based rural-tech company, has raised

\$10 million in a recent funding round led by investors such as Cornelius (Conny) Boersch, Founder of Conny & Co., a serial entrepreneur, Singaporean angel investor Koh Boon Hwee, Apoorva Ranjan Sharma - cofounder of Venture Catalyst and 9 Unicorns, Ramit Mittal of Bharti Family, and other Felix advisory served as the round's financial advisor.

The funds will be used to increase Faarms' geographical footprint in India, expand their supply and distribution channels, recruit new employees, and advance their technological

infrastructure. Faarms aims to provide a complete solution for rural households, including last-mile door-to-door delivery of farming inputs, as well as advisory, insurance, and banking services.

Faarms recently partnered with Bharat BillPay to create a marketplace for farmers across India to manage recurring payments like water, gas, and electricity bills, loan repayments, insurance premium payments, and secure products like seeds, cattle feeds, and farming equipment delivered directly to their doorstep via the Faarms-owned and operated logistics network.

Taranbir Singh, co-founder of Faarms, stated in a statement, "Our goal is to build the ultimate digital platform that allows rural households to operate in a seamless, profitable, and effective manner, thereby increasing their incomes and living standards. Recent studies in multiple states covering more than 200 villages have shown that using quality agri inputs results in higher double-digit growth in disposable

income. Together with other stakeholders, we are attempting to double farm income."

GADVASU Hosts 'Dairy Farming: A Profitable Venture' Training Program



July 26, 2022: Department of Veterinary and Animal Husbandry Extension Education, Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana organized a two-week training program on dairy farming with the motto- "Dairy farming—a profitable venture".

Dr. Rajesh Kasrija and Dr. Y.S. Jadoun coordinated the training program and informed that 13 trainees from different parts of Punjab enrolled for this training. Deliberations on latest nutritional and health management; comfortable housing; effective first aid management; preventive vaccination and deworming; breed improvement through utilization of better germ plasm; value addition of milk; reproductive and seasonal management were made during the training. Trainees were imparted theoretical as well as practical know-how of dairy farming. Trainees had hands-on-practice on recording basic vital parameters like rectal temperature, respiration rate; restraint; calculating weight of animals without measuring balance and milk testing. They were trained to differentiate between healthy and diseased animals.

Dr R.K.Sharma, Professor and Head,



Department of Veterinary and Animal Husbandry Extension Education apprised the farmers of training programs that Vet varsity organizes throughout the year to prepare a trainee as a good entrepreneur in the field of Dairy, Poultry, Goat, Pig or Fish farming. He informed that the University also publishes books and magazines for livestock farmers in Punjabi, Hindi and English. Farmers can even get guidance from university experts at Pashu Palak Tele Advisory Kendra (PP-TAK) dedicated numbers 62832-97919, 62832-58834.

At the valedictory session, trainees were facilitated with the participation certificates by Dr. R. K. Sharma along with the faculty members of the department.

Dr. P.S. Brar, Director of Extension Education appreciated the efforts of faculty members for the successful organization of the training program and said that diversification of the livestock sector is moving at a very fast pace. GADVASU is always working to improve the socio-economic status of the livestock owners by providing them with recent inputs. He informed that dairy farming is a very profitable venture, but there is an urgent need to do farming on scientific lines.

PM Modi launches Sabar dairy projects in Gujarat's Sabarkanta

July 28, 2022: Prime Minister Narendra Modi inaugurated a mega milk powder plant and other Sabarkantha District Co-operative Milk Producers' Union Ltd (Sabar Dairy) projects in Gujarat's Sabarkanta district.

The Prime Minister also performed the groundbreaking ceremony for Sabar Dairy's 3 lakh litre per day Ultra High Temperature (UHT) milk plant, as well as a 30 metric tonne per day cheese plant and whey processing plant.

In remembering the founder of Sabar cooperatives, the Prime Minister stated, "The story remains incomplete if we do not remember Bhurabhai Patel when it comes to Sabar Dairy." His efforts from decades ago are still changing the lives of millions of people today. There is no



corner that I am unfamiliar with or have not visited previously. Even today, when I visit Sabarkantha, the faces of many people flash before my eyes; you have seen what the situation was two decades ago, and I know."

Dairy provided stability and security to the rural economy, as well as new opportunities for advancement, he said. Prime Minister Modi stated that the government has worked tirelessly to increase farmer incomes. "From agriculture to animal husbandry, we have seen a significant increase in the incomes of even the smallest farmers," the Prime Minister claimed. "Today, Gujarat has a dairy market worth Rs one lakh crore," he said.

The Prime Minister stated that new roads and broad gauge lines have greatly reduced travel time from Himatnagar to Mehsana.

"This is an effort to keep the flow of milk flowing in Gujarat, which has marked the country's path to prosperity through cooperation," said Gujarat Chief Minister Bhupendra Patel. This is the land where tribals made priceless sacrifices for the British. This white revolution will be brought to Aravalli and North Gujarat by Sabarkantha."

"Under Prime Minister Narendrabhai Modi's visionary leadership, India is committed to becoming self-sufficient in a variety of areas." "We at Sabar Dairy are committed to supporting the government's vision and mission while also helping farmers increase their income," said Shamalbhai Patel, Chairman of Sabar Dairy and Gujarat Cooperative Milk Marketing Federation (GCMMF).

Sabar dairy began with 19 milk cooperative societies and now has over 1800 milk cooperatives.

Guests of honour included Chief Minister Patel, Navsari MP and Gujarat BJP president CR Patil, and state Cooperation

and Industries Minister Jagdish Vishwakarma.

Hatsun Agro plans to expand milk collection in Andhra Pradesh, Telangana, and Maharashtra.



HAP intends to expand its milk collection centres in outlying areas to ensure farmers have access to the facility and reap the true benefit of having such a facility in their own village, providing them with market access and contributing to the prosperity of our rural sector.

Hatsun Agro Product Ltd. (HAP), India's leading private sector dairy company with brands like 'Arokya,' 'Hatsun,' and 'Arun Icecreams,' has announced procurement expansion plans in Andhra Pradesh, Telangana, and Maharashtra. HAP operates over 3100 milk collection centres in Andhra Pradesh, Telangana, and Maharashtra, benefiting farmers. HAP plans to aggressively expand its network of milk collection centres in these three states, allowing it to effectively serve over one lakh farmers.

Hatsun Agro Product Ltd obtains all of its milk directly from farmers and has invested heavily in procurement infrastructure over the years to effectively handle a large volume of milk.

HAP is India's first dairy company to work on increasing farmer income by lowering production costs. The company has been working with universities to commercialise high-yielding, protein-rich hybrid Napier green fodder (kambu/bajra) varieties like Co-4 and Co-5.

Many HAP farmers have cut the cost of feeding their cows in half by growing Co-4 and Co-5 hybrid fodder. Labor costs have been significantly reduced by using

cow dung as manure, brush-cutters to save harvesting labour, rain-guns to reduce water consumption, and milking machines.

Chhattisgarh to procure gaumutra to promote organic farming

On Thursday, Chhattisgarh became the first state in the country to purchase gaumutra (cow urine) for Rs 4 per litre as part of an effort to promote organic farming in the state.

On Thursday, Hareli Tihaar (a Shravan month festival), Chief Minister Bhupesh Baghel launched the procurement of cow urine initiative at the CM House in Raipur. He became the state's first gaumutra seller when he sold 5 litres of cow urine for Rs 20 to the Nidhi self-help group in Chandkhuri.

Nidhi self-help group deposited this amount of gaumutra sale into the Chief Minister's Relief Fund at Baghel's request.

Baghel worshipped agricultural equipment and tools and prayed for the prosperity of the state during the grand Hareli celebration programme held at the CM House.

"Considering the multi-dimensional positive impact of Godhan Nyay Yojana, many states have started adopting this scheme. Under this scheme, people from all sections of society are selling cow dung in Gauthan at Rs 2 a kg. In the last two years, an amount of more than Rs 300 crore has been transferred to the accounts of cow dung vendors, Gauthan committees and women's groups through Godhan Nyay Yojana. The Chhattisgarh government is committed to make the farmers and the agriculture sector of the state prosperous," Baghel said while addressing the function. He added that the increased use of organic fertilisers and organic pesticides will reduce farming cost and also improve the quality of food.

The Godhan Nyay Yojana was launched in 2020, on the occasion of the Hareli festival. Cow dung is purchased from cattle rearing villages under the scheme for Rs 2 per kg.

According to the release, agricultural scientists believe that cow urine is a better and less expensive alternative to insecticide, chemical insecticide. It is far more resistant to disease than chemical insecticides.

Milk Moovement raises \$20 million USD to transform the supply chain of the dairy industry.

5 Aug 2022: Milk Moovement, a cloud-based dairy supply chain software company, announced that it has closed a \$20 million USD Series A round led by VMG Catalyst, a venture capital firm that invests in technology that powers the next generation of retail and consumer businesses. The new funding will help to accelerate product development and adoption of Milk Moovement among North America's leading dairy companies.

The over \$600 billion global dairy industry has yet to experience a major digital transformation, and the finite delivery windows of a perishable product and constantly shifting consumer preferences make the industry ripe for disruption. Milk Moovement's technology platform brings the industry from pen-to-paper and legacy systems to the cloud – creating full supply chain visibility for dairy farmers and their distribution partners to track and route shipments in real-time, optimize delivery schedules, and ultimately create a significant decrease in food waste and loss of profits.

Milk Moovement currently has a network of 2,500 dairy farms and over 5,000 users, including Fortune 100 CPG companies from around the world. Every year, the company manages over 30 billion pounds of raw milk, which equates to roughly 15% of the US dairy market. Milk Moovement's annual recurring revenue has more than doubled in the last year. Early adopters of Milk Moovement, such as United Dairymen of Arizona, California Dairies Inc, and many more to be announced this year, are at the forefront of this growth.

Editorial Calendar 2022

Publishing Month: January Article Deadline : 30th, Dec. 2021 Advertising Deadline : 3rd, Jan. 2022 Focus : Disease Prevention	Publishing Month: February Article Deadline : 30th, Jan. 2022 Advertising Deadline : 3rd, Feb. 2022 Focus : Herd Management	Publishing Month: March Article Deadline : 28th, Feb. 2022 Advertising Deadline : 3rd, March 2022 Focus : Heat Stress	Publishing Month: April Article Deadline : 30th, March 2022 Advertising Deadline : 3rd, April 2022 Focus : Cold Chain Mgmt.
Publishing Month: May Article Deadline : 30th, April 2022 Advertising Deadline : 3rd, May 2022 Focus : Nutrition	Publishing Month: June Article Deadline : 30th, May 2022 Advertising Deadline : 3rd, June 2022 Focus : Environmental Control	Publishing Month: July Article Deadline : 30th, June 2022 Advertising Deadline : 3rd, July 2022 Focus : Calf & Heifer Mgmt.	Publishing Month: August Article Deadline : 30th, July 2022 Advertising Deadline : 3rd, August 2022 Focus : Processing
Publishing Month: September Article Deadline : 30th, August 2022 Advertising Deadline : 3rd, September 2022 Focus : Milking Practices	Publishing Month: October Article Deadline : 30th, September 2022 Advertising Deadline : 3rd, October 2022 Focus : Feed & Fodder	Publishing Month: November Article Deadline : 30th, October 2022 Advertising Deadline : 3rd, November 2022 Focus : Winter Management	Publishing Month: December Article Deadline : 30th, November 2022 Advertising Deadline : 3rd, December 2022 Focus : Methane Emission

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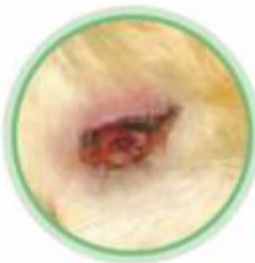
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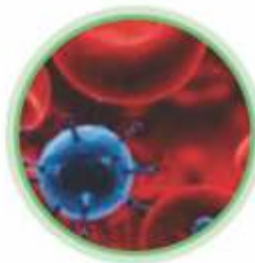
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