

DAIRY PLANNER

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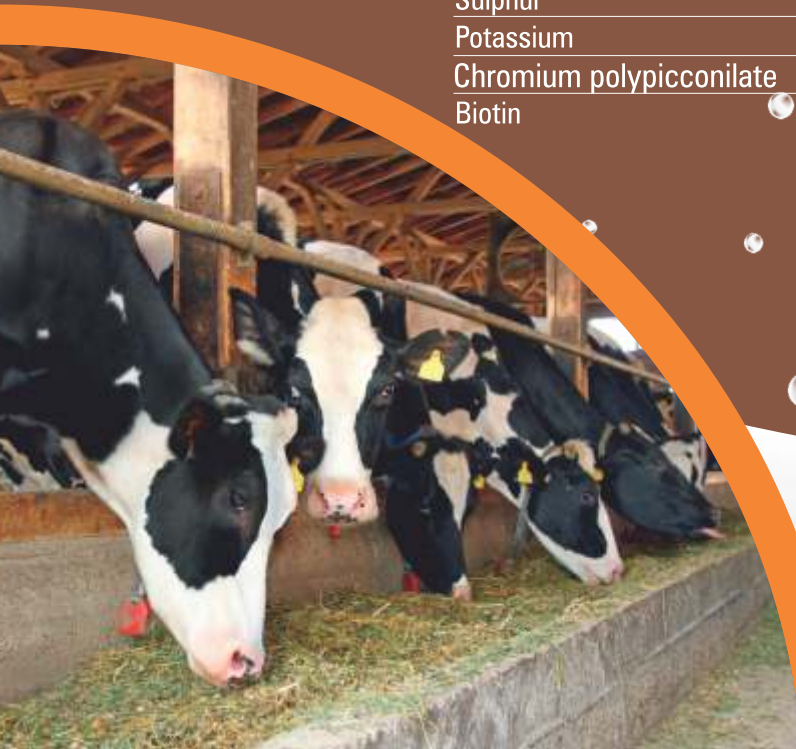
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From the Pen of Chief Editor



Sanitation and Disinfection in Control of Diseases on Farm

Cleaning and disinfecting is imperative to maintain the well being and health of high producing animals, such as dairy cows. Sanitation addresses the cleaning—and disinfection when necessary—of people, equipment, animals and material entering a farm. Routine farm operations such as feeding, milking, animal handling, medical treatments, contact with vehicles and equipment, interactions with

service providers and outside visitors, are all possible contact points for the transfer of diseases and pests. Entry and exit routes from buildings and a property have the potential to bring and take away disease-causing organisms.

The presence of organisms in the animal shed contaminates the milk produced thus reducing its self- life, milk produced in an unclean environment is likely to transmit diseases which affect human health.

Similarly, the presence of flies and other insects in the dairy farm area are not only disturbs the animal but also spreads deadly diseases to the animal's egg. Various problems in practical implementation for prevention of diseases are due to the fact that the majority of livestock is managed by illiterate and ignorant persons who ignore the basic principles of hygiene and sanitation. Majority of causes for spread of diseases could be ascribed to improper sanitation which gives shelter to carriers of germs.

Sunlight is the most potent and powerful sanitizer which destroy most of the disease producing organism. Disinfection of sheds means making animals free from disease producing bacteria and is mainly carried out by sprinkling chemical agents such as bleaching powder, Iodine and Iodophor, sodium Carbonate, Washing Soda, Slaked lime, Quick lime and phenol.

Bacteria are everywhere: in soil, in water, on animals and on humans. The purpose of disinfection is to decrease infection pressure and thus decrease disease prevalence. Choosing the disinfectant adapted to each specific situation leads to effective prevention and a profitable dairy farm.

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.

In the area of disease prevention, the veterinarian and other specialists should to work with the livestock producer to form a team that keeps animals healthy. Such programs should include, in addition to the routine immunizations and other clinical-surgical procedures, regular management consultations and provision of advice on nutrition, reproduction and udder health. To be effective, the practitioner must make regular visits and producers must be willing to compensate them for time invested rather than just on a fee-for-service basis.

Vishal

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Latest Inoculants for 21st Century Farming

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A bacterial silage inoculant is often considered an integral part of the silage-making process. Farmers Guardian looks the importance of different strains of bacteria and highlights some of the latest silage inoculant technology research.



Selecting the right silage inoculant for the right situation can improve the fermentation process, preserve more of the valuable nutrients and provide your animals with a highly palatable and nutritious feedstock to be used through summer and winter.

Dr Ivan Eisner, global product manager for the silage inoculant portfolio at Chr. Hansen, explains there are different types of bacteria when it comes to silage inoculants.

He says: "We talk in general terms about lactic acid bacteria (LAB). We refer to homofermentative and heterofermentative strains when we discuss their broad modes of action.

"We also talk about their species names, such as *Lactobacillus plantarum* or *Lactococcus lactis*. But

I realise to the untrained eye, this does not always tell us what we really need to know."

Dr Eisner says while all LAB produces lactic acid, some also produce acetic acid and the speed, amount and conditions required for them to do that change according to the specific strain of bacteria being used.

He says: "It is at the strain level that we really start to understand what a bacteria is doing. The strain name is usually a jumble of letters and numbers on the end of the bacteria name.

"These letters and numbers are what tell us exactly which bacteria we are speaking of. At a gene level, the difference between two strains of the same bacteria species could be bigger than the difference

between humans and mice, so the difference in their performance can be quite substantial.

Equal

"What this really means is not all bacteria are created equal. There are thousands of different strains of all bacteria species, including the ones we use in variations in the way each of them behaves in the differing conditions we present them with, and variations in the results we will get."

Dr Eisner says this means that simply because two silage inoculants contain the same species of bacteria, such as *Lactobacillus buchneri*, those two bacterial strains could behave quite differently with other bacteria in the inoculant and in the fermentation process, ultimately resulting in a different response both in the silage and eventually the animal.

He says: "We know that many products on the market contain similar species, but these are not the same strains. Each manufacturer uses their own strains for their own reasons.

"We know that some strains hold certain advantages. We know that when it comes to making well-fermented, palatable silage, which stays fresh and promotes intakes, strains matter."

Dr Eisner says much of the

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knowledge on silage inoculants in the market today is not necessarily incorrect but is a little outdated.

He says: "We should start any conversation about making better silage by first referring to silage management. These principles are the same as they have always been; get the air out, keep the air out."

"This was, and still is, a great place to start. Once we get into inoculants, it is science-based and research-proven, which means new findings are shaping our thinking on a very regular basis."

Traditionally, the theory behind a good inoculant for silage-making was to promote a rapid reduction of the pH by using organisms which produce very high levels of lactic acid, creating an unfavourable environment for spoilage organisms and reducing the loss of dry matter.

Enemy

Dr Eisner says: "In many ways this is not completely incorrect, but with new technology we can now go one step further. The real enemy of good fermentation is oxygen and the speed at which we can get most of that oxygen out of the silage."

"All the bacteria used in silage inoculants are designed to do their job in anaerobic conditions. Until the oxygen is gone, we cannot benefit from the anaerobic LAB to reach our terminal pH, so this must come first."

In most silage clamps, the process of removing oxygen is started during compaction and finishes under the sheet up to six weeks later.

Oxygen

Dr Eisner says, however, that there are now products available to purchase on the UK market which 'actively scavenge oxygen' from the silage, so almost oxygen-free conditions can be established in less than 24 hours.

Another assumption made in silage inoculants, according to Dr Eisner, is that heterofermentative products are only useful in preventing aerobic spoilage and heating.

Dr Eisner agrees clamp management plays a huge role in aerobic stability, but that there has to be more to it or heating would never happen in well-managed clamps.

He says: "While it is true that heterofermentative species of bacteria, such as *Lactobacillus buchneri*, help prevent aerobic spoilage, they do so much more than that."

"In many cases, it is the combination strains which makes the biggest differences. Sometimes when you add two strains together, you get the benefits of both strains in what we

would call an 'additive' effect."

"Sometimes though, through the right research, you can find two strains which give a multiplicative effect, where one and one now equals three or four or even five."

Some new combination products containing both homo- and heterofermenting strains can provide more than just the sum of their parts.

Some products offer early opening with silage which has finished fermenting in only seven days, providing improvements in palatability and feed intakes and even inhibition of clostridium.

Research

Dr Eisner says: "These are real second and third generation technologies we are seeing in some silage inoculants, and if it is backed with genuine research, they can make a real difference to the quality of your silage."

"It is not just about protecting yourself from a silage disaster anymore. Modern inoculants are about making significant improvements."



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Management of Dairy Animals in Winter Season

Dr. Navkiran Kaur¹, Priyanka², Dr. Sehajpal Singh Dhillon³ and Bhawanpreet Kaur⁴

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Navkiran Kaur



Dr Sehajpal Singh Dhillon

Introduction

Dairy farming is one of the most important means of providing livelihood and nutritional security to the vast majority of rural masses in India. In order to gain profit from dairying efficient management is of utmost importance. In dairying the milk production not only depends on the best breeds but also on animal health and good management. Housing plays a very important role in exploiting real potential of dairy animals. It constitutes about 75% of total cost of milk production in dairy animals. Good farm management should be adopted to increase the farm profitability. To ensure longevity and long-term productive capability of dairy animals it is necessary to provide healthy and comfortable environment to them.

Why extra care is needed in winters?

Winter is a fact of life in which severe cold temperatures, frequent dangerous wind chills, and blowing are common occurrences. Cattle increase body heat production as a response to severe cold exposure by increasing their metabolic rate (heart rate, respiration and blood flow). Although this physiological response enables cows to withstand extremely low temperatures in relative comfort, they also require more feed in order to maintain their body and production. For this cows may require up to 20 percent more feed during cold weather. During this season many animals often refuse to eat, become feverish and pneumonic. This affects the milk production, health and reproduction of the animal. Production performance of the animal will also be

affected when it is too cool because increased proportion of energy will be used for maintenance of body temperature and productivity depends on the ability of the animal to keep normal and stable body temperature.



Care during winter season

Nutrition

Before the weather gets cold, assess the body condition of each animal and adjust the nutrition they are receiving to adequately prepare them to thrive in winter conditions. Cows need more calories to keep themselves warm, especially cows with less than moderate body condition. In case of nutrition especially balanced rations,

fortified and supplemented with protein ingredients like whole cotton seed or cakes, becomes important. Rations containing about 17 per cent fiber in the animal feed are also helpful to increase fat percentage in milk.

Concentrate mixture should comprise grains (40 per cent), oil cakes (32 per cent), brans (25 per cent), mineral mixture (2 per cent) and common salt (1 per cent). Apart from this the extra energy-rich grains at approximately 0.8 per cent of body weight should be fed to counter the stress of cold for maintaining normal milk production and other activities.

Water





Ensuring your herd has access to fresh, clean water is essential to their health. In the winter, battling frozen water buckets and tanks can be a challenge. By utilizing tank heaters, heated buckets or automatic waterers, water is kept ice-free and at a temperature the animal is comfortable drinking.

Shelter

Increase barn temperature- Supply of heating in the winter keep the animals healthy, less chances of calf pneumonia, diarrhea and mortality. Reduce humidity to ensure better ventilation, preventing excessive moisture in sheds, roof dripping and ground freezing phenomenon. Ventilation should be carried in afternoon. Less water should be

used in winter barn to wash the ground and dry cleaning should be followed. In the afternoon sunlight, cattle should be kept out of the barn. Bedding should be provided to protect them from cold floor. Waterers or water tanks should not be frozen. Eave inlets should not be closed. This will restrict the ventilation rate and create wet, damp conditions.

Other management practices

Having dry teats when the cow leaves the parlor is important. One way to lessen the risk is to dip the teats, allow the dip of about 30 seconds and then blot dry using a paper towel. To protect animals from a sudden drop in temperature, keep the animals in a covered shed/area during the night.



Blankets can be used to retain body heat for individual animals. Avoid keeping animals in a damp area, as well as protect them from smoke from fires which are lit to provide warmth. The dampness and smoke increases their chances of contracting pneumonia.

Special care of calves in winters

Blankets are most useful for calves less than 3 weeks of age that are not yet eating grain. Warm blankets should not be so hot that they cause skin burns or sweating during the day. Prevention of the radiant heat loss. Thick, dry straw or sawdust at resting area should be provided for better insulation. Wind drafts must be avoided because they encourage heat loss. Young dairy calves have very little stored fat they can use for warmth. To cope with cold stress by feed with extra energy should be provided. Additional amount of feed (starter, milk replacer, or milk) that a calf would need to eat to compensate for extra energy used to keep warm during cold weather. Calves less than 3 weeks of age increases the amount of milk or milk replacer to provided extra energy. Repeated changes in the calf's diet should not be done. Calves that are eating starter, especially those over 3 weeks of age have a lower LCT and can more easily cover their increased energy needs by voluntarily eating more grain is beneficial in terms of generating heat. In cold weather, provision of warm water three times per day for a minimum of 30 minutes each time in order to ensure calves have ample opportunity to drink.



Optimising Fertility In Bovines

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Reproductive performance of an animal primarily depends upon the genetic makeup of animals together with appropriate husbandry practices, in order to ensure that the intervals from calving to conception are short and rates of conception to breeding are high resulting in higher milk production and a maximum number of progenies per elite animal. Under field conditions, in spite of many efforts, the conception rate ranges between 35-50% following artificial insemination indicating greater loss of embryos during various developmental stages.

The establishment and maintenance of pregnancy is a highly complicated process involving the embryo, uterus, and cow. In cows, fertilization rates are generally reported to be close to 90 percent while average calving rates fall within 50-60%. Thus, embryonic and fetal deaths account for about 75% of all reproductive wastage, following single breeding. Early embryonic death within 20 days of fertilization would seem to account for about 75 to 80 percent of all embryonic and fetal deaths and results in a substantial loss in production. The greatest loss occurring between day 8 and day 18 after fertilization. Of the remaining loss, most estimates in the literature suggest that about 10 to 15 percent occurs at or near the time of implantation and 5 to 8 percent

between implantation and full term. As most of the losses occur on or probably before day 18, the normal sequence of events in the luteolytic process results in a dramatic decrease in progesterone level, removing its negative feedback influence and allowing follicular growth, estrus, and ovulation to occur. Thus, providing another chance to become pregnant but in most cases, it becomes difficult to ascertain the specific reason resulting in failure. There are many strategies that can be followed to improve conception rates under field conditions when the causes of failure are uncertain.

Nutritional requirements and reproductive efficiency:

Energy and protein:

There is a very close interrelationship between the nutritional status of animals and reproductive performance. Different physiological stages and processes need different levels of nutrients in the diet. These include the period of rapid growth during puberty, parturition, and peak lactation which also correspond to the time to rebreed the following calving. Peak production time is the time when it is very difficult to meet the nutrient requirements of the dairy cows and to improve on her for fertile estrus and conception. If the heifers are well fed, usually they start sexual rhythm/cyclicity at about 10-12 months and conceives

at about 16 months of age. About 11-12% of crude protein is required to sustain adequate rumen ammonia levels for normal rumen fermentation, digestion, and dry matter intakes. These levels are adequate for normal function in heifers, bulls, and dry cows. Higher protein levels should be fed for growth and lactation. Mineral and vitamins should also be supplemented for continued reproduction.

Feeding propylene glycol:

Propylene glycol (PG), derived from propylene. It is frequently used as an oral drench in order to increase propionate in the treatment of ketosis in postpartum dairy cows. Propylene glycol linearly increased glucose and insulin.

Feeding whole flax seed:

Inclusion of whole flax seed in the diet of cattle has been observed to decrease embryo mortality that conceived within 120 days after calving. Plasma progesterone concentration between days 17-21 were greater for cows fed whole flax seed than other feed additives.

Water:

Water is essential for the transport of nutrients, normal digestion, and assimilation of nutrients as 45-60% of body weight is due to water. It is also compulsory to regulate the body temperature and excretion of waste material from the body. Generally, an adult cow consumes

35-55 liters of water per day. Fresh and clean water should be ensured 24 hours to the animals for better production and reproduction.

Health and vaccinations:

Timely vaccination against major infectious diseases should be followed since calf hood to adult stage and should be followed strictly for their booster doses. Deworming schedule for internal parasites should be followed regularly for the normal development and good reproductive efficiency.

Accurate detection of heat:

Inaccurate heat detection occurs when cattle are inseminated but are not in true estrus thus, resulting in a poor conception rate. Viable sperm should be present at the fertilization site before the egg arrives. Breeding either too early or too late allows an aged sperm or an aged egg to interact at the site of fertilization and will result in poor conception.

Insemination site in estrous female:

The target for semen deposition is the uterine body, accurate tip placement is probably the most important skill involved in the whole AI technique. Inseminators generally identify this target area by feeling the end of the cervix and the tip of the gun as the gun emerges through the internal os or opening. Depositing the semen in the uterine horns may result in lower conception rates.

Conception in bovines:

Experiment on cows has shown that 10 seconds of manual clitoral massage following artificial insemination hastened ovulation by

4.3 hours compared to females that did not receive clitoral massage and a higher conception rate was shown in stimulated females (75%) compared to non-stimulated females (67.45%).

Gonadotropin-releasing hormone (GnRH) and its analogues cause an acute secretion of luteinizing hormone (LH) and follicle-stimulating hormone (FSH) such that concentrations in peripheral blood are elevated for a 3-5 h period. GnRH-induced alterations in the function of the corpus luteum (CL) or follicle appear to be indirect through alterations in LH and FSH secretion. Repeated injections of regression, of GnRH during diestrus or single injections late in diestrus will cause acute increases in plasma progesterone and a delay in CL regression. Injections or continual administration of GnRH during early phases of CL development appear to augment CL differentiation and alter subsequent CL function. These effects are attributable to an induced increase in LH. Gonadotropin-releasing hormone (GnRH) and its analogues cause an acute secretion of luteinizing hormone and follicle-stimulating hormone (FSH) such that concentration in the peripheral blood are elevated for a 3-5 hour period. GnRH-induced alterations in the function of the corpus luteum (CL) or follicle appear to be indirect through alterations in LH and FSH secretion. Repeated injections of GnRH during diestrus or single injections late in diestrus will cause acute increases in plasma progesterone and a delay in CL regression. Injections or continual administration of GnRH during early

phases of CL development appear to augment CL differentiation and alter subsequent CL function. These effects are attributable to induced increases in LH

GnRH post-breeding:

The use of GnRH analogue buserelin administered in mid diestrus has been shown to increase early pregnancy rate, reduce embryo loss and increase litter size in several species.

Dextrose:

Administration of dextrose 20% @500 ml i/v 2 hours before insemination of the animal in repeat breeders has also been observed that it improves the pregnancy rate in bovines.

Oxytocin:

Conception failure in bovines may result due to atony of the uterus during the estrous cycle as it helps in transport of gametes. It has been in practice in such cases that the administration of 25-30 IU IM post-breeding helps in improving conception.

High environmental temperature stress and its management.

The high environmental temperature may have an adverse effect directly on the survival of gametes (egg/sperm) or the developing embryo may die, resulting in early embryonic mortality. The conception rate may fall below 20% during the summer months, often fertility will not return to normal until late October or November. It is recommended to increase the energy of feed to account for reduced intake during hot weather, providing shade over the feeding and watering area is another way to increase feed intake by heat-stressed cows.

Biosynthesis of Milk

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Oshin Togla

Introduction

Mammary epithelial cells in mammary gland synthesize complex milk constituents from simple components present in circulating blood. Mammary gland is equipped with an extensive network of arterial and venous blood capillaries. The components of blood needed for milk biosynthesis are extracted from arterial blood. To produce 1 litre of milk 500 ltr. of blood has to pass through the udder. The venous blood carries the blood back to the heart for recirculation and component renewal. Based on the percentage of precursor difference in arterial and venous blood, the ability of mammary gland to extract milk precursors from arterial blood is remarkable, in that it could approach as high as 20 L/min.

The ratios of major milk and blood components suggest that fat, sugar, potassium, calcium, magnesium, and phosphate are several times more abundant in milk than in blood. For instance, compared to blood, sugar content of milk is 90 times, calcium content is 13 times, phosphorus content is 10 times, fat content is nine times, and potassium content is five times more. Fat and protein are in colloidal dispersion; fat as emulsified globules with membranous coating and proteins as micelles. The minerals, vitamins, and lactose are in true solution form. For biosynthesis of milk constituents, the primary substrates extracted by mammary epithelial cells from their counterparts in blood include glucose, amino acids, fatty acids, β -hydroxy butyrate, and salts.

Biosynthesis of milk proteins

In the ruminant animals, all food must pass through rumen prior to digestion in the stomach and intestines. A large proportion of dietary protein is transformed by rumen bacteria and protozoa, thereby generating high quality microbial protein with significantly better amino acid profile than that of the vegetable protein in the feed. After digestion, the microbial protein along with smaller quantity of feed protein (that escaped rumen digestion) gives rise to small peptides and amino acids. These are then transported across the intestinal wall into blood, which ultimately form the substrate for protein synthesis in mammary gland.

The substrate, amino acids from blood, is transported through the basolateral membrane to mammary secretory cell. The transporting systems may be sodium dependent or independent. Milk proteins are encoded by specific genes in the genome. The biosynthesis is initiated by gene expression, which itself gets initiated by the hormone-induced transcription factors.

1. Transcription occurs in the cell nucleus. It involves formation of messenger RNA, which carries the code of a specific protein. The mRNA is assembled in ribosomes attached to the rough endoplasmic reticulum (RER).
2. Activation of amino acids in the cytoplasm takes place by reaction with ATP and subsequent attachment to transfer RNA

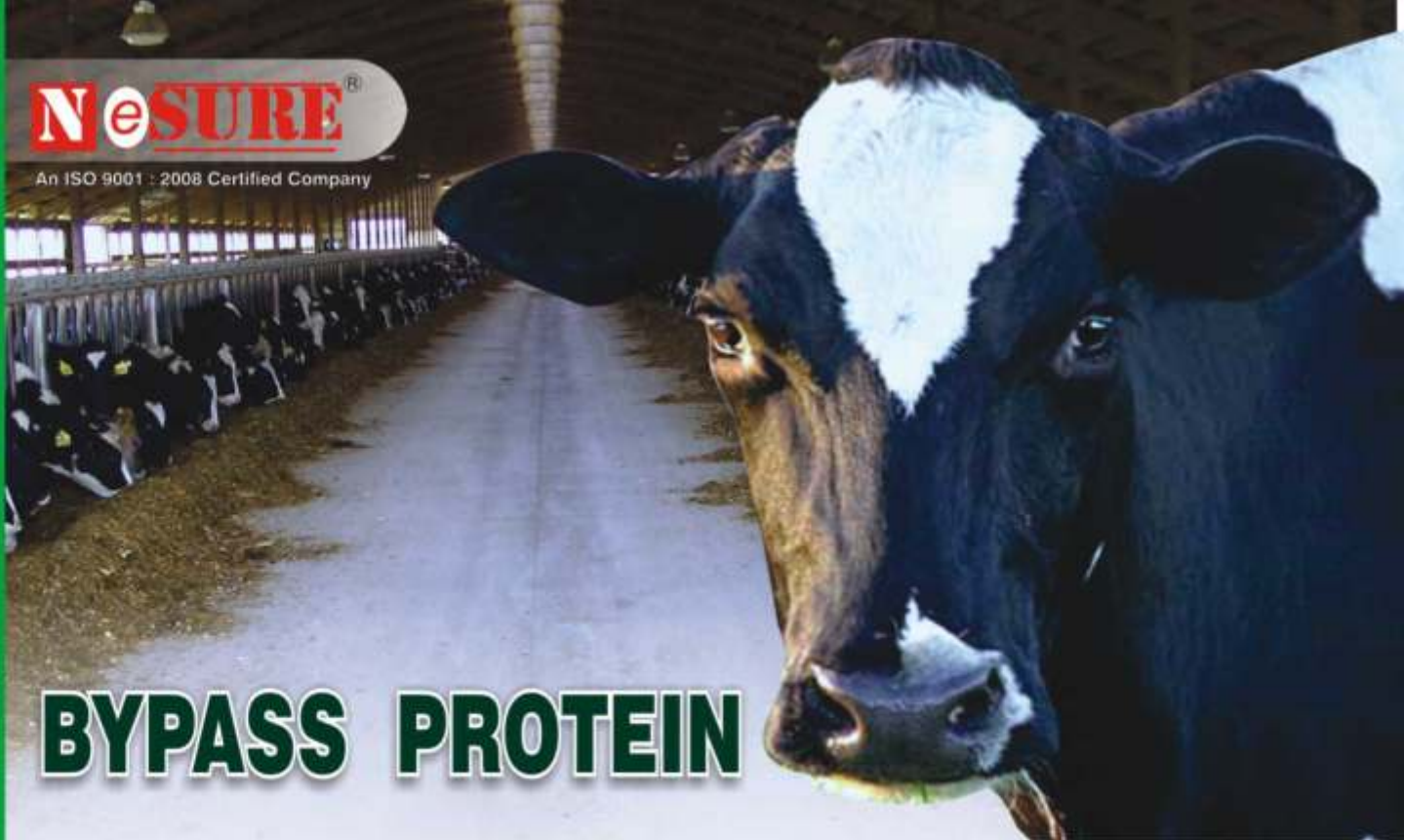
(tRNA). Each tRNA is specific for an amino acid.

3. Translation occurs in the ribosome. The code for amino acids resides in mRNA. Each code comprises of three nucleotides called codon. A trinucleotide called anticodon is contained in the tRNA, which recognizes the codon. Each codon comes into position and appropriate amino acid-tRNA complex is added to form peptide chain.

The polypeptide chain then folds up in a configuration dictated by the physical forces inherent to the sequence of the amino acids. Other groups like phosphates of calcium, as in case of casein, are added later. Finally, the protein assumes its three dimensional structure that gives the protein its distinctive function. Following synthesis, milk proteins being secretory proteins are transported from the cell into alveolar lumen to merge with other milk constituent pool.

Total nitrogen distributed among various fractions is; caseins (76%), whey proteins (18%), and non-protein nitrogen (6%). Casein exists as calcium phosphate complex in the form of colloidal suspension, while whey proteins occur in soluble form. Another type of milk protein occurs as a part of milk fat globule membrane, covering the envelope in which milk fat is enclosed. Casein molecules in milk occur as spherical particles called micelles.

Some milk proteins originating directly from blood enter mammary



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Mix "Nesure Bypass Protein" thoroughly with other feed ingredients (i.e. Homogeneous mixing) more than 7% for better results depends upon animal capacity of milk. The best way is to consult with your Nutritionist.

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- ◆ Better resistance against diseases .
- ◆ Help to control salmonella and reduce mould growth when used with cattle feed .
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gland via plasma cell adjacent to the secretory epithelium and are spilled into milk unchanged. Milk also contains various enzymes derived from biosynthetic activity. Urea, creatine, and creatinine are non-protein nitrogen compounds, which originate from blood as well. Minerals of milk are derived from blood and their level is determined by Donnan equilibrium and osmotic conditions.

Biosynthesis of milk lipids

Milk fat, in freshly secreted milk, occurs as microscopic globular emulsion of liquid fat in aqueous phase of milk plasma. The functional properties of milk fat are attributed to its fatty acid make up. More than 400 distinct fatty acids have been detected in milk. Typical milk fat consists of 62% saturated, 29% monounsaturated, and 4% polyunsaturated fatty acids. It contains 7–8% short-chain fatty acids (C4–C8), which is a unique characteristic of milk fat. Milk fat functions as a concentrated source of energy as well as a source of fat-soluble vitamins A, D, E, and K and essential fatty acids—linoleic and arachidonic acids. Cholesterol is a component of blood from where it enters milk pool.

The fatty acids needed in the synthesis of triacylglycerol (triglycerides) come from two sources described below.

1. Blood plasma lipids originating from digestion and absorption of dietary fat as well as by mobilization from adipose tissue. Approximately, 50% of fat fatty acids of milk owe their origin to blood lipids. In this regard, most of the C18 fatty acids and about 33% of C16 fatty acids originate from dietary fat.

2. De novo synthesis in the mammary epithelial cells utilizes acetate (C2) and β -hydroxybutyrate (C4) as sources of carbon. Nearly, all C4 to C14 fatty acids are synthesized from these two precursors.

The acylglycerols or glycerides of milk are synthesized in the cytoplasm surface of the smooth endoplasmic reticulum of mammary epithelial cells, employing a key enzyme Acetyl CoA carboxylase. This enzyme becomes very active during lactogenesis. Milk lipids are synthesized via α -glycerol phosphate pathway. Two acyl CoA molecules react with α -glycerol-3-phosphate to form phosphatidic acid, which converts to 1, 2 diacylglycerol upon removal of the phosphate. An additional long-chain acyl CoA adds the final fatty acid to form the triacylglycerol and CoA.

Biosynthesis of milk sugar (Lactose)

Glucose is the exclusive monosaccharide substrate for lactose biosynthesis. In ruminants, 45–60% of blood glucose is formed from propionate in the liver by Gluconeogenesis process.

In the bovine mammary gland, 60–70% blood glucose is used for lactose synthesis. Two molecules of glucose give rise to one molecule of lactose. Glucose is converted to UDP-galactose by a cascade of several enzymatic reactions. At the onset of parturition, the enzyme activity shows a dramatic increase to cope up with lactogenesis (the lactation process).

Glucose and UDP-galactose are combined to form lactose, catalyzed by the action of lactose synthetase that is composed of galactosyl

transferase and α -lactalbumin. The rate of lactose biosynthesis is determined by the availability of α -lactalbumin from the RER.

Secretion of milk constituents into the lumen

Milk constituents are individually synthesized inside the secretory cell. After they are transported to lumen space, they blend together to form so called milk. The process for secreting nonfat constituents differs from that of milk lipids. Milk proteins synthesized in the RER are incorporated into Golgi vacuoles or vesicles along with lactose and minerals. The secretory vesicles then separate from the Golgi apparatus and transport molecules towards the apical region of the cell. The membrane surrounding the vesicles fuses with the plasma membrane of epithelial cells followed by delivery into lumen space.

Milk lipids follow a discrete secretory process. As the molecules of synthesized milk fat transfer from the endoplasmic reticulum toward the apical membrane, their droplets grow in size. While passing through the apical membrane, they are pinched off as spherical globules with a coating of apical plasma membrane. The fat globule membrane forms an envelope around fat particles.

Milk fat globule membrane (FGM)

The fat globules are stabilized by a very thin membrane, closely resembling plasma membrane. The FGM is only 5–10 nm thick. The fat globule membrane consists of proteins, lipids, lipoproteins, phospholipids, cerebrosides, nucleic acids, enzymes, trace minerals, and bound water.

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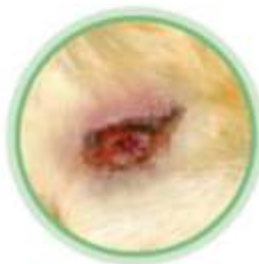
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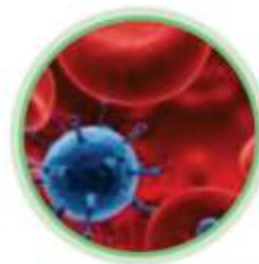
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Commercial Processing of Fodders Next Game Changer in Dairying

Dr. Harinder Singh

Excellent Enterprises Pvt Ltd-141401 mail: singh001h@gmail.com WhatsApp: +91-9914338223

India feeds & serves the largest cattle population in the world, the majority are underfed, malnourished, & non-performing while others are fed with nutritionally imbalanced & unprocessed feeds.

At the same time, during few days or weeks of the year, there is the problem of overfeeding (in some areas) as an excess of fodders, straws in the fields & underfeeding (in most areas) when there is no harvest, or drought, floods, rains, etc, thus affecting the performance of the animals.

The absence of fodder value-addition industry & commercial processing of fodders add woes to the growth of dairying in India but can revolutionize it through

1 Green Fodders as

- a) Silages
- b) Hays

2 Treated Straws

- a) Wheat Straw / Turri
- b) Paddy Straw / Paraali
- c) Pulses Straws, Maize Stalks, etc

3 TMR's (Total Mixed Rations)

For better supply of stuffed nutrients as proteins, minerals, energy, vitamins, etc.

Lack of coordination among industry-farmers-institutes, for

better outputs, starting from Seed-sowing to post-harvesting, processing, value-addition, matching-machinery, R&D services, Marketing aids, etc

Expenses on feed contribute 70% of the total economics of dairy farming, to tilt the balance as

babu rail mein- babu jail mein

To Achieve Profitability & Overcome Challenges of

- Handling
- Transportation
- Storage
- Enrichment & Value-Addition
- To serve the animals with more even & economical feeding recipes, round the year without being affected by excess – deficient regimens due to drought, floods, crop failure, insect manifestation, etc
- To make available enriched fodders, straws at all the time at farmers' doorstep without affected by market fluctuations
- Recent price fluctuations in feed ingredients (soybean, binolla, mustard, maize, etc) have forced. The common dairy farmer to look for more viable, nutritious, economical feed alternates/ ingredients. & silage, hays, TMR's, enriched straws has emerged as the only & best choice before him.

What is Silage?

- Silage is the value-added, fermented, preserved form of the fodder, in ready-to-use form, & can be served to the animal round the year.
- Mostly fodders with grains from Gramineae family are preferred for quality silage (like maize, oats, wheat, barley, etc) though other crops are also used to produce silage.
- Moisture: Dry Matter ratio plays important role in the production of good quality silage, preferred levels are 66 – 72 % (moisture) & 28 – 34 % (dry matter)
- Other indicators like milking stage, 2-3 leaf drying, grain-setting, etc are also taken into consideration while harvesting the fodder (for silage production)
- Chopping size of 3.0-8.0 mm is preferred for maize, 5.0-10.0 mm is preferred for oats, wheat, with a grain-cracker mechanism in harvester machines. Harder & bold-sized chopped grains go indigested into the animal system & drain out as such through feces, thus causing loss to the farmers without being converted into additional milk or SNF.
- Immediately after the

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chopping, the fodder should be ensiled immediately (into bales, bunkers, poly-tubes, poly-bags, etc) & should make air-tight to check for damage by aerobic bacteria

- Once the fodder gets properly ensiled, it generates a lot of heat & the anaerobic bacteria starts producing lactic acid, thus causing lowering of the pH to produce acidic conditions. Once the fodder gets ensiled and the anaerobic bacteria start producing lactic acid thus causing lowering of PH to produce acidic conditions.
- Various biochemical processes going on during the storage, harmful aerobic bacteria become inactive, and the fermentation goes on for 23-25 days (inside baled silage) & for 35-40 days (inside pit or bunker silage), all related to the level of anaerobic conditions created by hi-compression & contact

of oxygen with the fodder.

- Inoculants are used to promote the fermentation, encourage anaerobic bacteria (mainly lactobacillus, streptococcus, etc), control the quality damage, (by moulds, fungi, toxins, etc), provide palatability & sometimes flavor to the silage.
- Silage should be tested to achieve quality parameters.
- A good quality silage is of yellow-green color, serves well with rich nutrition, in fermented form, with vinegar smell, so should be checked for high moisture, toxins, fungus,

Silage (maize)	Value
PH	3.8 - 4.2
Protein %	7.8 – 9.2
ADF %	25 - 45
NDF %	35 - 55
Starch DMC %	28 - 34

moulds, foul smell, manifestation, etc.

What is Hay?

Hay is a dehydrated form of fodder where excess moisture is removed through sun-drying or dryer-drying.

- Hay is the rich form of fodder, with more dry matter serving the animals more nutrition(proteins, energy, minerals, vitamins, etc) per Kg of fodder.
- With the removal of excess moisture from the fodder it is easy to store and the shelf life is increased without affecting the quality and nutrition loss.
- Easy to handle and serve.
- Easy to transport.
- Proteins unit from hay is much cheaper than from cakes, grains, etc.
- Usance of fodder & hay at dairy farms will affect their balance sheet and turn into a profitable venture with better results on calf growth, milk, fat, etc.



For the production of good quality silage, selection of crop & stage of harvesting plays an important role.

- Harvesting of fodder moisture (of the whole plant) should be 60%-70%
- Lower 2-3 leaves should be brown, upper 3/4th will be green.
- Upper covering should be starting to turn dry & with a dull-yellowish-green color.
- If pressed grain with the thumb, milk from grain should ooze out. (dough stage)
- 20-30% of grain should be whitish milky remaining be yellow or orange.

Start feeding silage at 20-25% of fodder + Straw quantity & go on

increasing up to 70-80% in next 4-5 days. Once animals accept & start relishing, you may feed 90-100% replacing fresh green fodder or straws.

Fodder for Climate change

Are we ready for the worst of climate change or have we yet to start chai-pakora meetings for extremes of summer, winter, rains, drought, snow, etc. Climate change has already started affecting animal performance through milk yield, fat, pregnancy, conception, fetus abnormalities, immunity, etc. including fodder production.

Moreover, the use of more processed fodder in animals' daily rations will spare more costly ingredients such as maize, wheat, barley, etc. for humankind to

relieve pressure on commonly consumed items. Government should come forward to offer incentives, funding, etc to encourage more fodder processing units, it will also go to help in crop diversification programs.

With our company's hard & consistent efforts over the last 30 years, we have seen quick emergence of fodder processing units in many states of India & many start-ups are now putting up baled silage, hay-pelleting & treated straw units that is not only a positive sign for animal nutrition but also will come up as a game-changer in dairy farming to counter soaring prices of other protein sources like soybean, binolla cake, mustard cake & GNC/GNE.

Press Note

Stall of the Indian Fodder Industry Association (IFIA) was a big attraction during Dairy Tech-2021 held at BIEC, Bengaluru, from Oct 28-30,2021. In addition to visitors from Pan-India, there were also visitors from Nepal, Sri Lanka, Bhutan,

Bangladesh, UAE, Saudi, Malaysia, etc. With rising awareness of dairy as an exclusive & supplementary business, and the inclusion of more processed fodders in the daily diets of the animals, visitors were getting more details on baled silage, hay blocks, treated straw blocks, TMR's, UMMB, mineral lick blocks, etc, to counter the rising costs of concentrate feeds, ingredients, labor, storage, transport, etc. Dr. Harinder Singh attended all the queries & presented services of IFIA, to promote concepts that can help in taking down the input costs of milk production & Dairy farming, to make it more professional & profitable as feeding costs contribute approx. 65-70% of expenses & input costs of dairy farming.

With the feeding concepts being promoted by IFIA, dairy farmers can now focus more on increasing the herd size, breeding, Management etc thereby may better his farm's balance sheet & hence the net returns.

Dr. Harinder informed his company Excellent Enterprises Pvt. Ltd is promoting these concepts since 1992 & now there are More than 142 silage units in India processing fodders & serving dairy farmers & animals with more nutritious & economical nutrition.

IFIA is always ready to serve the fodder processing industry, interested entrepreneurs, NGOs, cooperatives, gaushalas, fodder growers, etc in case Requires any technical support, information, guiding, or any kind of help, anytime.

Replacement Stock

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Shivam Bhardwaj

Introduction

Planning, implementing and managing a replacement program is as important as the milking, feeding and reproduction management on a dairy farm. Better care and management of heifer will give high quality replacement stock to the dairy farm.

Rearing cows which have aborted, repeat breeders, have bad udder confirmation, structurally unsound, bad temperament, low productive, or suffering from any incurable disease will incur excessive loss to the farmer, and must be culled timely. Keep as long as the animal is productive and not likely to die or become problem and sell the animal in time frame of high value cull price. Culling is costly but failing to cull for fertility, structure, disposition, and productivity leads to creating greater problems in the future.

The average annual culling rate for dairy herds is around 20 percent, and replacement rate (20-25%) is generally kept little higher than this for gradual growth of the farm without causing excessive economic burden. Herd replacement contributes a significant cost in the dairy enterprise. Moreover, a primipara heifer's first lactation will pay for its rearing expenditures rather than contributing in farm's profit. The cost of replacements is typically second only to milk cow feed costs.

Replacement cost

The cost of raising a heifer from birth to calving is a sizable investment, it must be made sure that every animal being raised has the best chance of being profitable.

Let us assume a herd of 100 animals with variables A, B and C as:

A: Replacement female price (rearing price around Rs. 45,000; bought new replacements: Rs. 80,000); B: Cull cow price (Rs. 20,000), C: % of herd replaced (25%)

- If all animals are farm reared, replacement cost = $(A - B) * C = (45,000 - 20,000) * 25 = \text{Rs. } 6,25,000$ in a herd of 100 animals
- If all animals are purchased = $(80,000 - 20,000) * 25 = \text{Rs. } 15,00,000$
- 50% reared (12.5) + 50% purchased (12.5) = $25,000 * 12.5 + 60,000 * 12.5 = \text{Rs. } 10,62,500$

Farmers are aware that heifer rearing is expensive, but they still keep almost all the newborn heifer calves to ensure enough young stock are available to replace culled dairy cows. When too much young stock is kept, they are sold.

Replacement strategy

Number of heifers required depends upon the goal for the herd replacement program. The goal can be expanding the herd or to sell extra heifers for supplemental income or simply to maintain the herd size.

1. Purchase young bred females from outside

2. Retain heifers from own farm that are developed and bred for herd replacements
3. Herd maintenance: Maintain static herd size by replacing culls with a constant replacement rate.
4. Herd reduction: Allow herd to reduce under high cattle prices by low replacement rate.
5. Herd expansion: Expand herd under by retaining greater numbers for breeding.

Raising and Buying

To obtain herd replacement stock, two options are available with the farmers, i.e. raising them himself or purchasing from outside. He should decide based upon investment, comfort, profit, available farm facilities, availability of good replacement stock for purchase, health situations outside the farm, etc.

Raising heifer on farm provides greater opportunity for information so we can expect more accurate selections for genetic improvement. It will become easy to implement programs like progeny testing for herd sires. It further minimizes unfavorable permanent non-genetic effects (permanent environment effect) producing a better adapted stock. We can check for biosecurity, there are minimal chances of introduction of new foreign infections in the herd. Extra profit can be generated by selling out the surplus heifers. Main disadvantage of this method is that it leads to more investment without immediate profit for 2-3 years. The

uncertainty in the availability of full-grown heifers occurs due to mortality and growth and reproduction problems in the rearing period.

Purchasing is beneficial when exceptionally good stock is available easily. Farmer does not have to wait longer as immediate returns will start coming as soon as the heifer reaches AFC. Buying a better genetic merit bull or AI from the one having better breeding value than our herd's average will provide immense potential for genetic improvement in subsequent generation. It will maximize heterosis and complementarity. Buying heifer will eliminate the need to include certain traits like calving ease and we can focus solely on genetic improvement for production. We can use all the good quality pasture and feed resources for income generating cows rather than spending it on heifer rearing. Purchasing sources can be government or private dairy farms, university or institutional farms, milk colonies, breed societies, animal fairs and scientifically running Goshalas, Gosadans and Pinjrapoles.

Factors to consider while selecting replacement heifers

- 1. Positive genomic profile:** Check pedigree of the heifer. It should be sired by high genetic merit bull and from a recognized farm maintaining cows similar to our herd. Further, the sire must have scored well in breeding soundness evaluation.
- 2. Age:** Date of birth should be checked and age should not be more. It should have attained puberty at early age and body weight should be 2/3rd of the adult cow of the particular breed.
- 3. Birth weight and size:** Birth weight and size should be moderate, neither high nor low.
- 4. Temperament:** Heifer should be docile and easily manageable.
- 5. Genomic testing:** Presently its being done at research level but in near future commercial herds and rich farmers may go for genomic profiling for economic traits.

Heifer development for replacement stock

The primary objective of a replacement program in dairy herd should be to shift the heifers into the milking herd as quickly as possible. This ensures that the maintenance cost is minimized, there is the earliest possible return on the investment and that the heifer can produce well during her first lactation.

Heifer development should not be neglected. Evaluate, identify and develop heifer into cows which will provide more profit. Ideally they should be the daughters of elite dams and proven sires, but most of the times such records are unavailable, so the farmers need to go for other factors like body condition scores, dam's yield, freedom from diseases, structural soundness and average daily gain (ADG). One should never underestimate the value of heifer development on the profitability of the herd. Breeding undersized animals is never profitable. Undersized heifers have more calving problems, produce less milk, have greater difficulty getting back into calf and compete poorly with older cows for feed. For the heifer the calving is first time and it may have difficulty in calving, so take extra care during calving. Animals lagging behind below the required

standards should be removed from the herd. Because they are still growing, heifers will use some of their feed for growth rather than for producing milk and are more likely to be culled for poor milk yield and/or infertility.

One of the most important factor influencing the cost of heifer replacements on a dairy farm is the age at first calving (AFC). Lesser the AFC, sooner the heifer will start giving profit, lesser the farmer has to spend on maintenance cost of the heifer. Poor growth and reproductive problems greatly reduces the number of heifer calves reaching AFC because these heifers have a higher probability to get culled otherwise there will be delayed availability for replacement, causing unnecessary economic burden. Achieving early AFC also greatly depends upon the nutrition and weight gain of the animal, so we need to maintain a higher ADG per day. But, attempting to get a heifer to grow faster than the upper limit has proven to be counter-productive in udder development and lactation. Age at first conception for zebu ranges from 25-28 months, for crossbreds around 21-23 months and 30-35 months in buffalo. Target weights and body size must be achieved timely.

Conclusion

Every heifer calf born on the dairy should be looked at as a future source of revenue, either as a milk producer or as a herd replacement for another farm. Dairy replacements are, at the same time, both costly and valuable. Getting the heifers into the milk barn at an earlier age saves in long-term replacement costs, as well as getting more cows into the milking herd, which is the main objective.

Understanding the Difference Between Milk Allergy And Lactose Intolerance

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Progressive changes in eating habits of human beings have activated earnest changes in the quality of life. Easy availability of food with loads of calories associated has made the human population more prone to lifestyle associated disorders like obesity, diabetes, hypertension to name a few. With the upliftment of living standards and availability of wide array of foods, food allergies have become a common household name. Milk and dairy foods are healthy foods and are considered as nutrient dense since they serve as good sources of calcium and vitamin D as well as protein and other essential nutrients. With advancement in production and consumption pattern, safety aspect of the milk and milk products portray a very important aspect in relation to human health. There is anecdotal evidence of confusion between lactose intolerance and milk allergy among both patients and physicians, which could result in unnecessary dietary restriction or avoidable reactions. Terminology such as suspected 'milk allergy', 'milk intolerance', and also 'lactose intolerance' are often used without a clear sense of the different meanings, understanding of the different mechanisms that underlie them, or the dietary implications of the diagnosis.

Milk Allergy

Milk allergy is one of most common allergies, especially in children. This allergy occurs when the body's immune system reacts to milk protein. It can trigger an allergic reaction. The allergic reactions may vary from mild (rashes, hives, itching, swelling, etc.) to severe (trouble breathing, wheezing, loss of consciousness, etc.) (Fig 1). It usually starts before the age of one and most of the children outgrow it by age 3.

Symptoms of milk allergy are:

- (I) Skin
 - Red, rashes, itchy and swelling
- (ii) Respiratory passage, mouth

- Trouble in breathing or swallowing
 - Running nose accompanied with coughing
 - Itching, swollen lips
- (iii) Digestion
- Nausea, vomiting
 - Diarrhoea, cramps
- (iv) Anaphylaxis
- Acute allergic reaction, if not taken care may lead to death

Fig 1: Symptoms of milk allergy

Lactose Intolerance

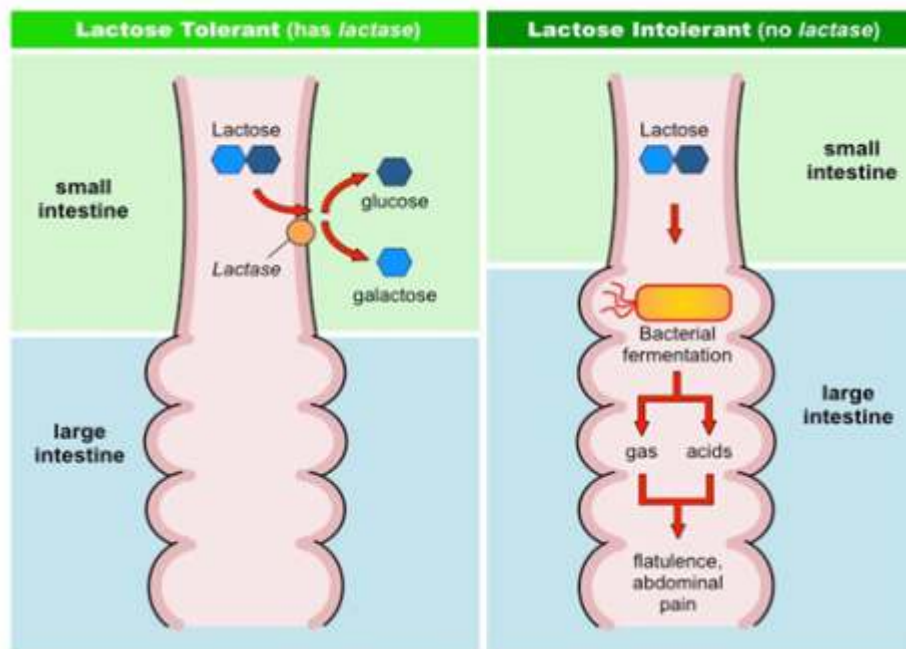
Lactose is the predominant sugar in mammalian milk. Intestinal absorption of lactose requires hydrolysis of disaccharide to its



component monosaccharides D-glucose and D-galactose, both of which are rapidly transported across the small bowel mucosa (Fig 2). Infants virtually have sufficient levels of lactase to digest nearly about one litre of breast milk. The lactase enzyme is naturally

produced by the cells that line the small intestine. It is also produced by the bacteria that live in the small intestine. But sometimes after weaning a genetically programmed reduction in synthesis of lactase resulting in very low lactase activity in some adult subjects, leading to a situation known as lactase nonpersistence. Lactase nonpersistence then further leads to partial digestion of consumed lactose; thus leading to malabsorption of lactose and the lactose reaches the colon. Attributed to enough amount of lactose in colon, person may experience symptoms of abdominal cramps, bloating and rumbling sound in stomach, excess flatulence, vomiting and loose stools or diarrhoea, a condition known as lactose intolerance (LI). Symptoms of lactose intolerance manifest 30 minutes to 1 to 2 hours after ingestion of milk containing (dairy) products.

Fig 2: <https://ib.bioninja.com.au/>



[standard-level/topic-2-molecular-biology/25-enzymes/lactose-intolerance.html](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4211111/)

LI can be diagnosed by performing certain medical tests:

(i) Stool Acidity Test- This test is usually exercised for infants or little kids. Stool sample is taken to find if lactose is hydrolyzed to simple sugars. Otherwise fermentation of lactose in intestine will lead to the formation of lactic acid which decreases the pH of stool.

(ii) Hydrogen Breath Test- This is the most common test to check LI. In this test, hydrogen content of breath is measured after consumption of a lactose containing drink. Increase in the level of hydrogen in breath indicates that the body is not able to digest or absorb lactose properly.

(iii) Lactose Intolerance Test- In this test the person is made to consume liquid containing lactose. Blood samples are taken after every two hours to check the blood glucose

levels. If there is no hike in blood glucose level, suggesting LI.

The person having LI are directed to limit the intake of products containing lactose such as milk, buttermilk, soft cheese, cream, custard etc.

Conclusion

Both milk allergy and lactose intolerance are manageable conditions with

slight diet modifications. There are a number of alternatives available for individuals with milk allergy like breast milk for high risk infants for as long as possible. Additionally, hypoallergenic formulas containing hydrolyzed proteins are safe to consume and least likely to cause an allergic reaction. Soy-based formulas are also an alternative but the drawback is that soy itself is an allergen to many individuals. Lactose can be managed by dietary modification and lactase enzyme supplementation. These products are available in many grocery stores and are just as healthy as regular milk and milk products. Alternative sources of milk nutrients like calcium, vitamin A etc are fish with soft bones, broccoli and leafy green vegetables, oranges, almonds, Brazil nuts, dried beans, tofu, products with labels that show they have added calcium, such as some cereals, fruit juices and soy milk. □

Stellapps Raises \$18 Million In Funding Led By Nutreco



Smart Systems, Stellar Applications.

Stellapps has completed the first close towards its pre-series C round from various investors. The total size of the round will be USD 18 Mn. This fundraising round also saw participation from existing investors including Qualcomm Ventures, Celesta Capital, and ABB Technology Ventures.

Stellapps is an end-to-end dairy technology solutions company.

Stellapps was founded in 2011 by five technology industry veterans who believed that IoT could transform rural India. Last year, Stellapps was one of the two Indian companies featured in the list of Technology Pioneers by the World Economic Forum. Its award-winning smartMoo technology solutions enhance productivity, milk quality and enable traceability. By enabling ecosystem partnerships through its online platform, Stellapps enables farmers to gain access to financial services, quality nutrition, and timely veterinary care. Stellapps' mooPay FinTech arm facilitates the financial inclusion of smallholder farmers by providing access to digital payments, banking, savings, cash withdrawal, credit, and insurance.

The latest funding round is a significant step forward to enabling Stellapps technology to solve these challenges. The technology is an internationally acclaimed farm to consumer dairy digitization service and will ensure that farmers gain access to services such as farm improvement, cattle nutrition, credit, and insurance, to help them capitalize on the growing market while improving their sustainable farming methods. Stellapps plans to deploy the funds to rapidly scale up its traceability network and extend its digital footprint across India.

Joost Matthijssen, Nutreco Director of Venturing, added, "Smallholder farmers account for two-thirds of dairy farmers in India. Realizing the full genetic potential of their animals is crucial to significantly increase sustainable productivity of the Indian dairy value chain. Stellapps' end-to-end digitised model can help to capture this growth potential by offering access to quality products, services, financing and markets. If successful, this innovative model could help pave the way for similar applications in other key regions, such as Africa.



Ranjith Mukundan, CEO of Stellapps remarked, "Our vision is to unlock unprecedented value across the dairy supply chain for all stakeholders, especially smallholder farmers. We are on a mission to shift the Indian smallholder farmers into the agripreneur orbit by enhancing productivity, improving quality, and enabling traceability through our smartMoo solutions.

Stellapps is the first of its kind startup in India working towards the digitization of the dairy supply chain. Stellapps is an IIT-Madras incubated company founded by a group of IITians and technologists with a strong industry background and rich experience including IIT-Madras, IIT-Kharagpur, and IIM-Ahmedabad alumni, with over 18 years of Industry experience across Wipro, Nortel, Ericsson, Alcatel-Lucent, AT&T, Vodafone, Telstra, Bharti-Airtel, Aircel, Avaya, Cisco et al. They produce and procure comprehensive farm optimization and monitoring support, which helps dairy farmers and cooperatives maximize profits while minimizing effort.

Stellapps is funded by Omnivore Capital – a fund anchored by Godrej Agrovet Limited and investment patrons include a large group of IIT alumni. Their innovative applications and state-of-the-art mechanization tools leverage the Internet of Things (IoT), Big Data, Cloud, Mobility, and Data Analytics to improve Agri- Dairy supply chain parameters, including milk production, milk procurement, cold chain, animal insurance, and farmer payments. Their SmartMoo™ IoT router and in-premise IoT Controller acquire data via sensors that are embedded in Milking Systems, Animal Wearables, Milk Chilling Equipment & Milk Procurement Peripherals, and transmit the same to the Stellapps

SmartMoo™ Big Data Cloud Service Delivery Platform (SDP) where the SmartMoo™ suite of applications analyze and crunch the received data before disseminating the Analytics & Data Science outcome to various stakeholders over low-end and smart mobile devices.



Co-founders' backgrounds

Ranjith Mukundan is the CEO & Managing Director. He's a telecom & software engineer who has lead a team of 250 people as part of the Wipro Telecom Application Practice and has 23 years of industry experience.

Ravishankar Shiroor is Director & Business Development Head. An IIT-Madras alumnus, he has 24 years of industry experience in embedded software and telecoms. He has been a strategy advisor at AT&T, Telstra, Nortel, Ericsson, and Alcatel-Lucent.

Praveen Nale is Director & Chief Technology Officer. He's also an IIT-Madras alumnus with 22 years of industry experience in Hardware, Embedded Software and Telecom. He has the unusual combination of hands-on exposure to both hardware and software.



From L-R: Praveen Nale, Ranjith Mukundan, Ramakrishna Adukuri, Venkatesh Seshasayee, Ravishankar Shiroor

Ramakrishna Adukuri is the Head of Software Solutions. He is an IIT-Kharagpur alumnus with 22 year of industry experience in Telecoms and Enterprise Architecture. He has been the chief Architect of unified communications & Cloud.

Venkatesh Seshasayee is the Head of Domain Solutions. He has 21 years of industry experience, including that of Chief Architect of Service Delivery Platform (SDP) technology deployed in many telecom service providers' networks.



“Improving Socio-Economic Conditions of BPL Families of Kheda District Through Animal Husbandry and Dairying” – DAIRYING AS A TOOL FOR POVERTY ALLEVIATION.

- Amul Dairy initiative

Amul in its continued endeavor to improve the socio-economic conditions of rural people extended its expertise in implementation of the Swarnjayanti Gram Swarozgar

Yojana (SGSY) of The Government of India (Ministry of Rural Development) on their Special Project on “Improving Socio-economic Conditions of BPL Families of Kheda District through Animal Husbandry and Dairying”– DAIRYING AS A TOOL FOR POVERTY ALLEVIATION.



above poverty line by providing them in generating assets to become self-employed. The purchase of assets is facilitated through a mix of government subsidy and bank credit.

It is a holistic self-employment programme as it supports all



The Swarnjayanti Gram Swarozgar Yojana is a holistic self-employment programme for the rural poor of India. The basic objective of the programme is to bring below poverty line families



stood as guarantor for the bank loans. These beneficiaries were then given membership of dairy co-operatives in order to bring these poor households into mainstream economy by transforming dairying into active income-generation enterprises. As part of this programme 12,647 women and men were trained in dairy husbandry in addition to construction of number of cattle sheds, development of green fodder plots, distribution of chaff cutters and stainless steel cans.

facets of self-employment like organizing them into Self Help Groups, helping them in selection of key activities, building their capacities, providing them appropriate training and exposure, building infrastructure, introducing them to new technology, and providing them marketing support. The programme is implemented through District Rural Development Agencies

(DRDAs) with active involvement of Panchayati Raj Institutions, banks, line departments of the Government and development institutions.

Amul has covered under this programme more than 8,755 beneficiaries to whom milch animals were distributed in the District of Kheda and



To provide ground water availability, 56 bore wells were dug. More than 50 mobile Artificial Insemination units are pressed in operation for these farmers to deliver services at the doorstep. A Mobile Diagnostic Laboratory has also been put in operation to provide effective health services along with round the clock service of veterinary doctors. This initiative has considerably helped in improving the socio-economic conditions and quality of life of a large number of BPL families.

India's First Banni Buffalo IVF Calf Born

Government encourages IVF of buffaloes to improve cattle wealth in the country



With the birth of first IVF calf of a Buffalo breed namely Banni in the country, India's OPU - IVF work has reached to next level. This first IVF Banni calf is born out of 6 Banni IVF pregnancies established at the doorsteps of a farmer, Vinay . L. Wala of Sushila Agro farms, located at Dhanej in Somnath district of Gujarat.

Prime Minister Shri Narendra Modi had talked about the Banni buffalo breed during his visit to Kutch region of Gujarat on December 15, 2020. The very next day, i.e. December 16, 2020, Ovum Pick-Up (OPU) and aspiration processes for the in vitro fertilization (IVF) of Banni Buffaloes were planned.

The scientists aspirated 3 Banni Buffaloes of Sushila agro farms of Vinay. L. Wala of Dhanej in Somnath district of Gujarat. They subjected 29 oocytes (egg cells) to intervaginal culture device (IVC) from these three Banni buffaloes. Total 20 oocytes from one of them were subjected to IVC.

In fact, 20 oocytes from one donor resulted in 11 embryos. Embryo transfer (ET) was done with 9 embryos, which resulted in 3 IVF pregnancies. Total 5 Oocytes from second donor resulted in 5 embryos (100 %). Of five embryos, four were selected for the ET which resulted in 2 pregnancies. From the 4 oocytes of the

third donor, 2 embryos were developed and the embryo transfer resulted in one pregnancy.

Overall, 18 embryos were developed from 29 oocytes (62 % BL rate). The ET of 15 embryos resulted in 6 Banni pregnancies (40 % Pregnancy rate). Of these 6 pregnancies, the very first IVF Banni Calf is born today. This is the first Banni Buffalo IVF calf in the country.

Both the government and the scientist fraternity see a great potential in the field of IVF of buffaloes and are striving hard to improve cattle wealth in the country.

Department of Animal Husbandry and Dairying organizes 2000 village level camps across 8 UTs and Goa for awareness on Entrepreneurship schemes

Rural Poultry Entrepreneurship component to give direct employment to 1.5 lakh farmers; 2 lakh farmers to benefit from sheep goats & poultry development

As part of Aazadi Ka Amrit Mahostav, Department of Animal Husbandry and Dairying organizes an awareness Programme on Entrepreneurship schemes of the Department through Common Service Centres network by holding 2000 village level camps across 8 Union Territories and Goa. Attendees were given complete information about these schemes, as well as how to apply on the scheme portal through the CSC itself.

Cabinet Minister for Ministry of Fisheries, Animal Husbandry and Dairying Shri. Parshottam Rupala addressed the farmers connected through camps and informed that as per recent Cabinet decision, the National Livestock Mission and Rashtriya Gokul Mission schemes now have a component of breeder farm entrepreneurs and fodder entrepreneurs. National Livestock Mission (NLM) will help in creating rural Entrepreneurship and help in creating better livelihood opportunity for unemployed youth and livestock farmers in the Cattle, Dairy, poultry, sheep, goat, piggery, feed and fodder sector paving the way towards AtmaNirbhar Bharat.

NLM & RGM schemes have a component of breeder farm entrepreneurs and fodder entrepreneurs, informs Minister to farmers

Posted On: 27 OCT 2021 8:31PM by PIB Delhi



During the function Minister stated that, these schemes will bring sharp focus on entrepreneurship development and breed improvement in rural poultry, sheep, goat and piggery including feed and fodder development. Rural Poultry Entrepreneurship component will give direct employment to 1.5 lakh farmers and 2 lakh farmers will be directly benefitted from sheep goats and poultry development. Fodder and fodder seed availability in country will be increased by many folds through creation of fodder entrepreneurs.

Later in the programme Minister interacted with Rural entrepreneurs from UTs today . He appreciated the efforts made by Thingley Norbu Ladakh who has popularised Yak cheese even beyond boundaries (Nepal), he talked to Idres Mustafa Qureshi from Srinagar J & K , who thanked the government for all Possible support in sheep husbandry. He showed a glimpse of his sheep rearing farm through a short video.

Minister spoke with Ms Sukhada Sil from South Andaman who requested for government assistance to small farmers

who want to start business with less than 500 animals minister assured all possible help to the entrepreneurs.

The CSC VLE OF Andaman and Nicobar Island Shri Vadivel introduced a small business farmer of Andaman island . He also requested minister to help small farmers who can buy less than 500 animals.

In the first of its kind interaction, a Union minister directly interacted with the beneficiaries and assured all assistance, through virtual mode.

The VLE of Lakshadweep Islands introduces minister to the farmers from Agatti Island . The entrepreneurs from Lakshadweep islands requested minister for providing veterinary doctors in hospitals.

As a part of Azadi ka Amrit Mahotsav, the rural empowerment and a glimpse of inclusive growth and inclusive governance could be witnessed in the Awareness and interactive camp held today.

The program was graced by Dr Sanjeev Balyan and Shri.L.Murugan, Ministers of State, Ministry of Fisheries, Animal Husbandry and Dairying and other dignitaries.



Union Minister of State for Fisheries, Animal Husbandry & Dairying unveils National Digital Livestock Mission Blueprint at NDDDB

Dr Sanjeev Balyan, Union Minister of State Fisheries, Animal Husbandry & Dairying unveiled the National Digital Livestock Mission Blueprint at NDDDB, at Anand ON 7th October. Shri Meenesh Shah, Chairman, NDDDB, Ms Varsha Joshi, Additional Secretary (C&DD), DAHD, Govt of India, Shri Upamanyu Basu, Joint Secretary (LH), DAHD, Govt of India, Dr Sindura Ganapathi, Visiting PSA Fellow, Office of the Principal Scientific Adviser, Govt of India, Dr RS Sodhi, MD, GCMMF, Managing Directors of various milk unions from Gujarat, senior officials of NDDDB and its subsidiaries, senior officials of TCS and Ernest & Young were present. A few senior officials also joined the event virtually.

Dr Balyan said that the livestock sector has a unique combination of being the backbone of rural livelihood. The growth would have been a lot better if there were concerted efforts to harmonise programmes across the country in order to create an ecosystem that is conducive for growth of the sector. This has been the main idea behind the deployment of NDLM, keeping the welfare of the farmer at the core.

The livestock sector is poised for a major leap after implementation of

NDLM, a digital platform being developed jointly by DAHD and NDDDB on the foundation of the existing Information Network for Animal Productivity and Health (INAPH). The aim is to create a farmer-centric, technology-enabled ecosystem where the farmers are able to realize better income through livestock activities with the right information.

Dr Balyan said that NDDDB is motivating and involving dairy farmers in multiple streams of income through diverse alternative activities targeted at their livelihood diversification and economic welfare.

Ms Varsha Joshi explained the importance and benefits of the software developed and urged all stakeholders to work for the successful implementation of the software.

Chairman, NDDDB said that the bedrock of NDLM will be the unique identification of all livestock, which will be the foundation for all the state and national level programmes including domestic and international trade. The farmers will be able to effortlessly access the markets, irrespective of their location or holdings through this digital platform as a wide-range of

stake-holders will be connected in this ecosystem. This system will also include robust animal breeding systems, nutrition, disease surveillance, disease control programmes and a traceability mechanism for animals and animal products.

Dr Balyan also visited NDDDB's manure management initiative at Anand's Zakariyapura village. While interacting with the farmers of Zakariyapura village he appreciated them for accepting the new technology of biogas plants. The bio slurry produced is primarily used by the farmers in their own field and surplus bio slurry gets sold to other farmers or converted into organic fertilisers. He observed the slurry processing facility at Vasna, Borsad. NDDDB's Sudhan trademark also helps them in creating a brand identity ensuring quality of products. Moreover, all the women biogas users have reported reduction in drudgery in bringing and burning fuel wood, and related health hazards.

Genetic improvement and raising productivity of the Indian bovine population remained the key focus when the Hon'ble Union Minister visited NDDDB's modern Ovum Pick Up & In Vitro Embryo Production

6th International One Health Day: Stakeholder Forum on ‘Industry and One Health’ organised by Department of Animal Husbandry and Dairying

Speakers and industry delegates share views on areas of collaborations to deal with emerging challenges in One Health

Effective stakeholder engagement is key to the successful use of the One Health approach to address global health challenges: Secretary

The Department of Animal Husbandry and Dairying, Government of India organized a Stakeholder Forum today on the theme ‘Industry and One Health’ to celebrate the 6th International One Health Day today as part of Azadi Ka Amrit Mahotsav. The day aims to highlight interdisciplinary and transdisciplinary engagements as well as multisectoral collaboration as aspects crucial to the implementation of the One Health concept.

Panelists on the forum included representatives from industry, Confederation of Indian Industry, World Bank, Bill and Melinda Gates Foundation, senior officials from Department of Animal Husbandry & Dairying, Government of India, and other experts.

Shri Atul Chaturvedi, Secretary, Department of Animal Husbandry & Dairying, GoI in his opening remark emphasized that “Effective stakeholder engagement is key to the successful use of the One Health approach to address global health challenges, ensure food safety and to tackle the food security challenge. The department is committed to work – in complementary mode in order to share the resources and expertise across the domains – with all the



stakeholders who will be contributing to furtherance of the one health in the country”.

“Indian Council of Agricultural Research is committed to tackle the emerging challenges in the area of One Health through collaboration and partnerships with all stakeholders including industry players. Historically ICAR not only developed technology like animal vaccines but also ensured the reach to grassroots level through active partnerships with companies. We seek active collaboration with industry to come forward and join hands to bring solutions for farmers,” said Dr. Trilochan Mohapatra, Secretary (DARE) & DG, ICAR

Eminent speakers and industry delegates have shared their views on the possible areas of collaborations to deal with emerging challenges in One Health. Participants discussed the required interventions, such as policy framework, regulation, financial, human, social, natural, and physical capitals, global learnings and best practices, and other relevant issues

On this occasion, the Department through the forum, invited all stakeholders to adopt the One Health approach and partake in research and innovation to successfully implement the One Health framework.

Shri Amit Shah, Union Minister of Home Affairs and Cooperation launches the "Dairy Sahakar" scheme



Shri Amit Shah, Union Minister of Home Affairs and Cooperation launched the "Dairy Sahakar" scheme at Anand, Gujarat today, during the function organised by Amul for celebration of 75th Foundation Year of Amul. Shri Parshottam Rupala, Union Minister of Fisheries, Animal Husbandry and Dairying, Shri Bhupendrabhai Patel, Chief Minister of Gujarat, Shri B.L. Verma, Minister of State for Cooperation, Government of India, Shri Devusinh Chauhan, Minister of State for Communications, Government of India, Shri Atul Chaturvedi, Secretary,

Department of Animal Husbandry and Dairying, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India, Shri Devendra Kumar Singh, Secretary, Ministry of Cooperation, Government of India, Shri Sanjay Agarwal, Secretary, Department of Agriculture and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India, Shri Sundeep Nayak, MD, National Cooperative Development Corporation (NCDC), elected representatives and other high dignitaries of Govt of Gujarat and Amul were present on the occasion. The Dairy Sahakar with a total investment of Rs 5000 crore will be implemented by NCDC under Ministry of Cooperation, Government of India to realize the vision, "from cooperation to prosperity". Under Dairy Sahakar, financial support will be extended by NCDC to eligible cooperatives for activities such as bovine development,

milk procurement, processing, quality assurance, value addition, branding, packaging, marketing, transportation and storage of milk and milk products, exports of dairy products within the overall objectives of "Doubling the farmers income" and "Atmanirbhar Bharat". There will also be a convergence with various schemes of Government of India and / or of State Government/UT Administration/ Development agencies/ bilateral/multilateral assistance/ CSR mechanism is encouraged. The Department of Animal Husbandry and Dairying under Ministry of Fisheries, Animal Husbandry and Dairying, Government of India is also implementing various schemes for development of the Animal Husbandry and dairy sector. This Dairy Sahakar will supplement the existing efforts for strengthening the dairy sector in the country.

Events

November 2021

1. ILDEX Indonesia 2021

Dates: 9-11 November 2021

Venue: Indonesia Convention Exhibition (ICE) Jakarta, Indonesia

Email: panadda@vnuexhibitionsap.com

Website: www.ildex-indonesia.com

December 2021

1. AGRE ME

Dates: 8 - 9 DECEMBER 2021

Venue: Dubai World Trade Centre (Dubai Exhibition Centre) Sheik Zayed Road Convention Gate, Dubai, UAE - United Arab Emirates

Email: info@agramiddleeast.com

Website: www.agramiddleeast.com

March 2022

1. Eurotier Middle East

Dates: March 21- 23, 2022

Venue: Abu Dhabi, National Exhibition Centre (ADNEC), Vereinigte Arabische Emirate

Email: s.karaoglan@dlg.org

Website: www.eurotiermiddleeast.com

August 2022

1. ILDEX Vietnam 2022

Dates: August 3-5, 2022

Venue: SECC, HCM, Vietnam

Tel: +49 69 75 75-52 03

Email: panadda@vnusiapacific.com

Website: www.ildexvietnam.com

2. Livestock Philippines 2022

Dates: August 23 - 25, 2022

Venue: World Trade Center Metro Manila, Pasay City, Philippines

Tel: +60162069096

Email: rita.lau@informa.com

Website: www.livestockphilippines.com

September 2022

1. Eurotier China

Dates: 18-20 Sept. 2022

Venue: Chengdu China Jiangsu Baima Agriculture International Expo Center Nanjing, China

Tel: +4962211357-15

Email: s.karaoglan@dlg.org

Website: www.eurotierchina.com

On-farm Feed Advisor shows potential to increase animal productivity and enhance farmer livelihoods



In early 2020, the International Livestock Research Institute (ILRI) launched the On-farm Feed Advisor (OFA), a mobile-based application designed to help farmers and extension workers balance nutrients in the diets of dairy animals. After undergoing successful pilot testing in India, OFA is being scaled up in various countries across the developing world where it has the potential to increase the yields of dairy animals and strengthen farmer livelihoods.

In mixed farming systems throughout Africa and Asia where livestock productivity remains far below the global benchmark, farmers use agricultural by-products, such as straws, stovers and haulms, to feed their animals. These feeds are often supplemented with home-grown or purchased concentrates, but most farmers lack an understanding of how the nutrient composition of daily feeds corresponds to the nutrient requirements of their animals. As a result, many dairy animals are over- or under-fed relative to their level of production, and farmers lose money by not purchasing the most cost-effective feeds.

A team led by Padmakumar Varijakshapanicker, acting head of ILRI's feed technology research platform in Patancheru, India, designed OFA to help smallholders in mixed farming systems overcome these challenges.

OFA is based on 'precision feeding'

principles, which match an animal's nutrient requirements to the nutrient supply in its diet. With minimal effort from farmers, OFA utilizes basic data on an animal, including its body weight, weight gain, milk production level and stage of pregnancy (if applicable), to calculate its baseline nutrient requirements. It can also determine the nutrients required to increase an animal's productivity based on its genetic potential. From these results, OFA selects the cheapest locally available feeds capable of fulfilling the animal's nutrient requirements and provides farmers with detailed advice on how to balance their animal's diet.

Despite its recent release, OFA is already receiving positive feedback. Field staff experimenting with the application in India report significant increases in milk production and reductions in feed cost. Another study from India shows that precision feeding techniques can increase dairy animals' milk yields by up to 14 per cent and milk fat levels by up to 15 per cent, culminating in an average 16 per cent increase in farmers' daily income per animal. Confirming these findings,

Padmakumar notes that it can 'help to reduce the yield gap in dairy animals in the mixed farming systems and can help reduce cost of feeding to below 60 per cent'.

These preliminary results demonstrate the tremendous potential OFA has to support least-cost diets and enhance animal productivity. As OFA moves beyond its pilot stage, policy support and training courses, which are currently being scheduled, are necessary to introduce the application to potential users. Ultimately, OFA is a boon to animal production that can benefit farmers and dairy animals across the world. As Padmakumar notes, it does not matter 'whether you are in India or Kenya or some other country—OFA is for the global audience'.

Mother Dairy Embarks On Expansion Spree; To Establish Over 700 New Exclusive Consumer Touchpoints In Delhi By FY22-23

- The Company plans to increase its network of around 1800 consumer touch points in Delhi to over 2500 by March 2023, mainly in the form of kiosks and franchise shops.
- Opens 15 kiosks in a single day – 9 in campuses of Delhi Skill and Entrepreneurship University and 6 in Delhi Cantonment area.
- Mother Dairy outlets are present in key neighborhoods such as RWAs & societies, university campuses, military zones, railway colonies, police lines, colleges, hospitals and DTC's depots, terminals, colonies, etc.

14th October 2021: Mother Dairy, Delhi's own milk and milk products major and a wholly owned subsidiary



of National Dairy Development Board (NDDB), on 14 October 2021, announced that it has embarked upon a journey to strengthen its consumer touch-point network in the NCT of Delhi, mainly led by kiosks and franchise shops.

Mother Dairy's consumer channel comprises of different forms of stores such as its own milk booths, franchise shops, kiosks, etc. With a collective count of around 1800 such shops, Mother Dairy is the single largest retailer of milk and milk products in the NCT of Delhi, having its own shops and outlets on such a wide scale. The Company is working towards increasing this count to over 2500 by FY22- 23, further strengthening its presence across the length and breadth of the capital region and at the same time, bringing quality products a step closer to the city dwellers.

Elaborating the plan, Mr. Manish Bandlish, Managing Director, Mother Dairy, said, "Being one of the largest retailers of the capital region, we take pride in serving our consumers with quality products 365 days a year. Our consumer touch points have become an integral part of the capital region over the years. Mother Dairy's outlets are present in prominent areas of RWAs, societies, military areas, hospitals, colleges, etc. which help meet the daily needs of our consumers. While serving the consumers, the strengthening of our sales network is also in line with our commitment of providing a robust and direct market access to the farmers of hinterland."

As part of the same strategy, Mother

Dairy opened 15 kiosks in the NCT of Delhi in a single day. Of the 15 kiosks, 9 have been established in 9 campuses of Delhi Skill and Entrepreneurship University (DSEU) and 6 in Delhi Cantonment area.

Mr. Manish Bandlish, Managing Director, Mother Dairy inaugurated a kiosk at DSEU Dwarka Campus in Sector-9, Dwarka in the august presence of Prof. (Dr.) Neharika Vohra, Vice Chancellor, Delhi Skill and Entrepreneurship University. Mr. Bandlish further added, "These structures of kiosks and franchise shops along-with our own booths have been instrumental in serving our consumers during testing times as well, providing quality products in close vicinity. We invite RWAs and other such institutions to reach out to us through our helpline number in order to enable us to set-up such kiosks and shops in their localities as well."

Mother Dairy's booths, kiosks, franchise shops, etc. offer the entire range of Mother Dairy products including products from Safal and Dhara under one roof and are equipped with digital payment options.

The Government pushes the agenda of 'Gender Mainstreaming in Agriculture by way of earmarking funds for women under various schemes/programmes

The Department of Agriculture & Farmers Welfare organized a webinar on 22 October 2021 on "Women in Agri-startups: Creating Value with Supply Chain Management" in the series of events for celebrating MahilaKisanDiwas 2021. The webinar



was organized under the guidance of Union Agriculture Minister Shri Narendra Singh Tomar and in the august presence of Minister of State for Agriculture & Farmers Welfare Shri Kailash Choudhary. During the webinar, Shri Choudhary also released an e-book depicting "Success Stories of 75 progressive women farmers and women entrepreneurs to commemorate 75 years of 'Azadi Ka Amrit Mahotsav'.

Inaugurating the webinar, Shri Kailash Choudhary stated that women's contribution to the development of agriculture has increased manifold. Women play a decisive role in ensuring Food Security and Preserving local Agro-Biodiversity. As per Prime Minister Shri Narendra Modi's vision of Aatma Nirbhar Bharat, the Government of India is committed to give priority to women for bringing them into the mainstream of agriculture development. He added that the role of women is not only confined to agriculture after India's independence but their contribution is visible in all sectors including defence, space, administration, sports, etc. It gives immense satisfaction and pride to see that women are fulfilling their dreams and reaching the thresholds in self-reliant India. The Minister also added that the formation of Farmer Producer Organizations will benefit Women Farmers in a revolutionary way.

The Webinar on Women in Agri-Startups focused on Enabling Women Entrepreneurship in Agribusiness; Strategy and Schemes to support Agri-Startups in India; Technology transfer to Startups for Commercialization;



Value Chain Management and Challenges faced by Agri-Startups Agripreneurs. Agriculture sector employs 80% of all economically active women; they comprise 33% of the agricultural labor force and 48% of self-employed farmers.

With women predominant at all levels of production- pre-harvest, post-harvest processing, packaging, marketing- of the agricultural value chain, to increase productivity in agriculture, it is imperative to adopt gender-specific interventions. The Government has tried to push the agenda of 'Gender Mainstreaming in Agriculture' by way of earmarking funds for women under various schemes/ programmes and development interventions; introducing 'pro-women initiatives' to help women derive the benefits of all beneficiary-oriented components of different programmes. The focus is on the formation of women Self Help Groups (SHGs), Women Federations, and Women Farmer Producer Organisations; capacity building interventions; linking them to microcredit; enhancing their access to information, and ensuring their representation in decision making bodies at various levels.

The Senior and middle-level extension functionaries, women farmers, and agri-entrepreneurs, and resource persons from various training institutes participated in the event. The successful women entrepreneurs from various States also narrated their views and experiences on the occasion.

NDDB to manage Varanasi Milk Union for 5 years



In an attempt to promote dairy farming in Uttar Pradesh, the Government of Uttar Pradesh has requested National Dairy Development Board (NDDB) to manage the Varanasi Milk Union for a period of five years. NDDB has accepted the request of strengthening state's dairy cooperative business. A Memorandum of Understanding (MoU) to this effect was signed between Govt of Uttar Pradesh, Pradeshik Cooperative Dairy Federation Ltd (PCDF), Varanasi Milk Union and NDDB during a virtual ceremony on 1st November 2021.

Shri Lakshmi Narayan Chaudhari, Hon'ble Minister of Animal Husbandry, Dairy Development & Fisheries, Govt of Uttar Pradesh, Shri Atul Chaturvedi, Secretary, AHD, Govt of India, Ms Varsha Joshi, Joint Secretary (C&DD), AHD, Govt of India, Shri Meenesh Shah, Chairman, NDDB, Shri Sudhir Garg, Principal Secretary, Dairy Development, Govt of Uttar Pradesh, Shri Shashi Bhusan Lal Sushil, Milk Commissioner, Govt of Uttar Pradesh, Shri Ravi Shankar Gupta, In-charge Managing Director, PCDF and Shri Arun Mishra, CEO, Energy Efficiency Services Limited (EESL) graced the occasion.

Shri Chaudhari said that in line with our Hon'ble PM's aim of doubling farmers' income, this developmental initiative of NDDB will motivate and involve milk producers and provide them the required economic resilience. This MoU will provide milk producers of

Uttar Pradesh the essential market access, while broadly keeping in view sustainability and viability of the overall operations. Using biogas to run Varanasi Milk Union's dairy plant will be a path-breaking innovation. This unique technology-driven initiative, will eventually bring rural prosperity. He appreciated NDDB's expertise in setting up modern dairy plants across India and making them profitable.

Shri Chaturvedi thanked Uttar Pradesh government for launching this project within a record time. He conveyed that Project Gir has been launched in Uttar Pradesh to fulfill Hon'ble PM's dream of increasing milk production. Under Rashtriya Gokul Mission, inducted Gir cows will be used to increase productivity through IVF technology and soon Varanasi Milk Union plant will be able to process 2 lakh litres of milk. He further stated that Varanasi Milk Union will be country's first Milk Union to have biogas-based tri generation plant installed. The plant is expected to suffice entire energy need of the dairy and contribute significantly towards reducing carbon footprint by reducing usage of traditional fuels.

Chairman, NDDB assured necessary support to Varanasi Milk Union so as to enable them better serve their members. He said that Dairy Board's efforts will be to streamline the governance processes, focus on providing remunerative price to milk producers and ensure that consumers get safe and hygienic liquid milk and milk products.

Ms Joshi mentioned the need for working together to fulfil Hon'ble PM's vision of enhancing farmers income, empowering women, conserving environment and using apt technology. She said that NDDB's intervention will bring the much needed transformation of rural households in Uttar Pradesh.



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