

# DAIRY PLANNER

HARBIL/2004/22481

Title Code HARBIL00698

Vol.19 | No. 10 | October - 2022





# THE NEW STANDARD

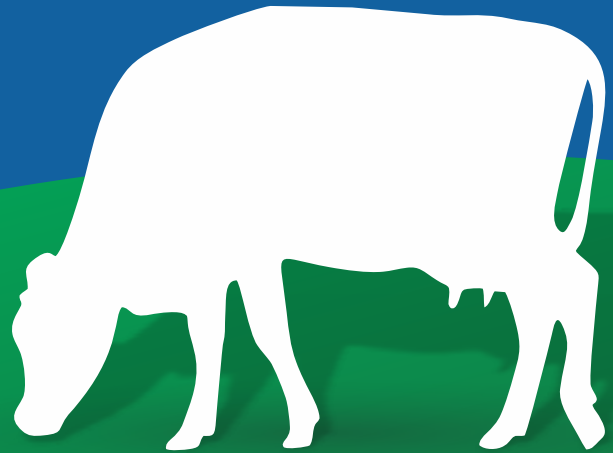
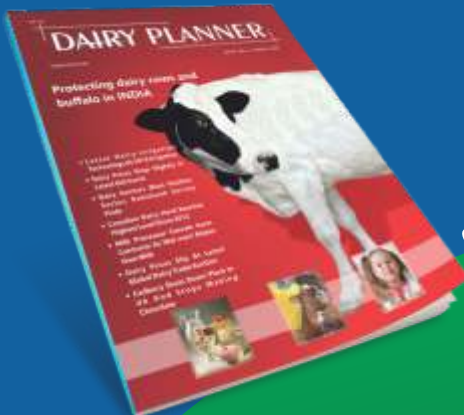
IN DEVELOPING TODAY'S BUSINESS

**BOOST**  
YOUR **BRAND**  
**VISIBILITY**  
with us

With Over  
**45,000+**  
Readership

Advertise with us  
**Today**  
See your business  
**Growing**

The Magazine Covers all the latest news, articles, Product Launches, CSR, Press Releases, New Appointments, Latest Developments & a complete industrial overview.



**Pixie Consulting Solutions Ltd.**

C/o OmAng Hotel, Namaste Chowk, Near Janta Petrol Pump, KARNAL - 132001 (Haryana) INDIA  
Email : poultry.pcsl@gmail.com, dairy.pcsl@gmail.com

+91 9991705007

- [www.facebook.com/poultryplanner123](http://www.facebook.com/poultryplanner123)
- [www.facebook.com/dairyplanner123](http://www.facebook.com/dairyplanner123)
- [www.linkedin.com/pixie-consulting-solutions-ltd](http://www.linkedin.com/pixie-consulting-solutions-ltd)

**Marketing Division : +91 741999 3009 / 999170 5007**





**THE DIGESTIVE SYSTEM IS DIRECTLY LINKED**



**TO THE HEALTH OF YOUR OPERATION**

Helping a calf meet its growth potential begins before birth. Novus researchers found that cows fed unique bis-chelated organic trace minerals containing methionine hydroxy analogue HMTBa during pregnancy produced calves with more muscle and stronger muscle fibers. This practice of maternal feeding—providing the right nutrients at the right time—can result in better performance from birth and beyond.

**MINTREX**<sup>®</sup>  
BIS-CHELATED TRACE MINERALS

Learn more about the solutions Novus is developing for your farm at [novusint.com](https://novusint.com)

\* Novus is trademarks of Novus International, Inc and are registered in the United States and other countries.  
TM SOLUTIONS SERVICE SUSTAINABILITY is a trademark of Novus International, Inc., © 2022 Novus International, Inc. All rights reserved.

**NOVUS**<sup>®</sup>  
SOLUTIONS SERVICE SUSTAINABILITY™

# From the Pen of Chief Editor



## Dairy feed & Fodder

Dairy farming is a significant component of Indian agriculture and the Indian economy. Feeding is an important part of the dairy industry because it accounts for roughly 70% of total milk production costs. Dietary feed ingredients for dairy cows and buffaloes include concentrates such as compound cattle feed, oil cakes, grains and their byproducts such as brans and chunnies; cultivated green fodders and grasses; and crop residues such as straws and stovers.

Feed and fodder are important parts of livestock nutrition. It is critical to achieve high and sustained livestock productivity by feeding a diet balanced in all nutrients at a level that meets the production goal while taking the animal's physiological state into account.

A minor change in an animal's feeding pattern, such as adding leguminous fodder, would increase milk production while also improving the animal's health. Azolla is a high-protein food. Silage improves the nutritional content of fodder.

The most important component of an animal's diet, and overall feeding standards are based on energy requirements. Meeting an animal's energy requirements can be a significant cost in feeding. Managers must develop a good feeding and management programme in order to meet livestock goals and herd performance objectives.

## OUR TEAM

**Vishal Rai Gupta**  
Managing Director  
vishal@pixie.co.in

**Siddhi Gupta**  
Co-Editor  
siddhi@pixie.co.in

**Kudiarasu J**  
General Manager- Sales & Marketing  
M: 74199 93009  
kudiarasuj@pixieexpomedia.com

**Bhavana Rai Gupta**  
Editor-In-Chief  
editor@pixie.co.in

**Parth Rai Gupta**  
Director

**Priyanka Patlan**  
Co-Editor  
M: 999 170 5007  
editor.pcsl@gmail.com

Designed By Prince

Website: [www.pixie.co.in](http://www.pixie.co.in)

## EDITORIAL BOARD MEMBER

**Dr. M S Mahesh**  
Asst. Professor, BHU, UP  
**Dr. J Tamizhkumaran**  
M.VSc., PGDEP., Ph.D.  
(Ph. D in Veterinary & Animal  
Husbandry Extension Education)  
**Dr. Anjali Aggarwal**  
Principal Scientist

**Dr. Sanjay K Latkar**  
Alembic Pharmaceuticals Ltd  
**Dr. Manisha Singodia**  
(MVSc Veterinary Science, Jaipur)  
**Dr. Annanda Das**  
(Ph. D Scholar, WBUAFS, Kolkata)  
**Dr. M. Arul Prakash**  
(MVSc Assistant Professor, Tanjore)

**Dr. B.L. Saini**  
(Ph. D IVRI, Izatnagar)  
**Dr. Bilawal Singh**  
(MVSc, Assistant Professor  
Ludhiana)

Office :  
**Pixie Consulting Solutions Ltd.**  
C/o OmAng Hotel, Namaste Chowk, Near Janta Petrol Pump,  
KARNAL - 132001 (Haryana) INDIA  
Email : [dairy.pcsl@gmail.com](mailto:dairy.pcsl@gmail.com) | [editor.pcsl@gmail.com](mailto:editor.pcsl@gmail.com)  
Website : [www.pixie.co.in](http://www.pixie.co.in)

## CONTENTS

Teat Lacerations in Dairy Cattle and Their Surgical Management	06
Dairy By-products and its Utilization	10
Prospects of Self Employment in Dairy Goat Farming with Special Reference to the ...	12
Adulteration of Ghee – A Critical Concern	14
Feeding Management of Dairy Animal in India	17
Anestrus : A Major Infertility Issue of Dairy Animals	20
Food Waste to Energy	22
Skin Glands and Their Roles in Animals	24
Steller	28
Making A Difference	30
Tech Chronicle	32
News	34
Save The Date	37
Editorial Calendar	38
Subscription	38

## ADVERTISEMENT

Ayurved Limited	39
Baani	40
Biosint	05
Irides	07
Novus	03
Pixie Consulting Solutions Ltd.	02
The Dairy Expo	27

**Editorial Policy** is Independent. Views expressed by authors are not necessarily those held by the editors.

Registered as Newspaper by Register of Newspaper for India : RNI No. HARBIL/2004/22481

Editorial & Advertisements may not be reproduced without the written consent of the publishers. Whilst every care is taken to ensure the accuracy of the contents of **Dairy Planner**. The publishers do not accept any responsibility or liability for the material herein.

Publication of news, views and information is in the interest of positive Dairy industrial development in India. It does not imply publisher's endorsement. Unpublished material of industrial interest, not submitted elsewhere, is invited.

The Submitted material will not be returned.

Publisher, Printer : **Mr. Vishal Gupta** on Behalf of **Pixie Consulting Solutions Ltd.** Karnal.

Printed at : Jaiswal Printing Press, Jain Market, Railway Road Karnal.

Published at : C/o OmAng Hotel, Namaste Chowk, Near Janta Petrol Pump, KARNAL - 132001 (Haryana) INDIA

Editor-In-Chief : **Mr. Vishal Rai Gupta**

All Legal matters are subject to Karnal.



# 5M+ Forte<sup>®</sup> Organic (CHELATED)

SUPERIOR QUALITY NUTRITIONAL  
SUPPLEMENT OF CHELATED  
MINERALS AND VITAMINS

**For Dairy Cattle, Sheep & Goat**



## COMPOSITION

Each 1Kg Contains :

Vitamin A	72,00,000 IU
Vitamin D3	77,000 IU
Vitamin E	275 mg
Nicotinamide	1200 mg
Zinc Glycinate	10000 mg
Manganese Glycinate	1800 mg
Magnesium Glycinate	6600 mg
Copper Glycinate	1600 mg
Ferrous Glycinate	1750 mg
Cobalt Glycinate	175 mg
Iodine as POTASSIUM IODIDE	360 mg
Calcium Glycinate	25.5%
Phosphorus	12.75%
Sodium	7 mg
Sulphur	0.72%
Potassium	110 mg
Chromium polypicconilate	300mg
Biotin	20mg

## BENEFITS

- Organic Chelated Minerals improve the important minerals bio-availability
- Effective in increasing Reproductive Performance
- For Improved Milk quality
- For better Health and Growth
- For the control of LAMINITIS in dairy cattle

## INSTRUCTIONS FOR USE

Daily Cattle : 50gm daily  
Sheep & Goat : 5-10gm daily  
or as advised by Veterinarian.

## PACKAGING

5M+ Forte organic is available in 1Kg/5Kg printed bags & Bulk Packs available.

## STORAGE CONDITIONS

To be stored in a cool, dry, dark place away from sunlight.



**BIOSINT<sup>®</sup>**  
NUTRITIONAL INNOVATIONS

For Further Details

**BIOSINT NUTRACEUTICALS,**

**Factory :** 19, Polupalli SIDCO Industrial Estate,  
Pillanakuppam PO, Polupalli Village,  
Krishnagiri - Hosur Highway,  
Krishnagiri - 635 115. TN, INDIA.

**Corporate Office :** 37, Krishna Nagar,  
KK Pudur 4th St, Coimbatore - 641 038.

Telefax : +91- 422 - 2430275, Mobile : 094435 17258

e-mail : [info@biosintnutraceuticals.com](mailto:info@biosintnutraceuticals.com)

[www.biosintnutraceuticals.com](http://www.biosintnutraceuticals.com)

# Teat Lacerations in Dairy Cattle and Their Surgical Management



**Urfeya Mirza<sup>1</sup>, Ufase Bin Farooq<sup>2</sup>**

Department of Veterinary Surgery and Radiology  
<sup>1</sup>Khalsa College of Veterinary and Animal Sciences, Amritsar, <sup>2</sup>M.R. College of Veterinary and Animal Sciences, Haryana  
 urfeyamirza@gmail.com

## Introduction

Teat injuries are common in dairy cattle, and, compared with other frequently occurring diseases, these injuries often result in premature culling of affected cows (Beaudeau et al., 1995). Teat injuries can be divided into two categories (external or internal injuries). All the different types of injuries/diseases, diagnostic approaches, and therapies have been thoroughly described (Couture and Mulon, 2005). This article focuses only on teat lacerations (external injury). Teat lacerations are viewed as catastrophic injuries for the survival of a cow within the herd. Many people do not realize that when treated appropriately and promptly, it is possible to repair the teat and keep the animal in full production. Teat lacerations can be challenging to repair, but with the appropriate knowledge and material, a practitioner can be very successful at it.

Not all lacerations are the same. Different prognoses are associated with different types of lacerations. A classification of the laceration with regard to the duration, the conformation, the localization, and the thickness are presented.

## Classification

Teat lacerations are classified according to the duration from time of trauma, the localization and conformation of the laceration, and the thickness of the lesion (full or partial thickness).

## Duration

Teat lacerations are categorized as acute or chronic (more than 12 hours old). Surgical intervention on the teat is best performed during the first 12 hours after the injury (Steiner et al., 2004; Couture and Mulon, 2005). Later, swelling of the teat can be too severe to permit adequate reconstruction of the tissue. These injuries benefit from medical therapy (hydrotherapy and a non steroidal anti-inflammatory drug) (NSAID) before attempting primary closure of the defect (delayed first intention healing). However, with complex lacerations (inverted "Y" or "U"), it is recommended to try primary closure even if the laceration is older than 12 hours. The repair may partially dehisce, but the portion that heals will facilitate the surgical revision performed later in the healing process.

## Localization and conformation

Teat lacerations are classified as simple or complex (inverted "Y" or "U"), longitudinal or transverse, and proximal or distal. The orientation of the blood supply of the teat is longitudinal. A transverse laceration results in more damage to the blood supply resulting in more oedema, avascular necrosis, and dehiscence postoperatively compared with a longitudinal laceration. The more circumference involved, the worse is the prognosis. Distal injuries involving the streak canal are also regarded as having a poor prognosis. Reconstruction of the



IRIS  
**MONEY**  
doesn't talk, it swears

# Happy cow Plus milk



## 4 Benefits

1. Money Plus Improves milk yield
2. Improves the fat percentage
3. Improves reproductive performance
4. Helps in better growth

## 2 Goals

1. More Milk
2. More Profit !!!



FOR FURTHER INFORMATION  
please contact +91 80 48663242 or [admin@irides.in](mailto:admin@irides.in)  
or visit our website [www.irides.in](http://www.irides.in)



streak canal is difficult and can cause partial or complete milk flow obstruction. Injury to the distal end of the teat compromises the defence mechanisms of the quarter against mastitis making the animal at higher risk for clinical or subclinical mastitis. Finally, distal injuries may lead to avascular necrosis of the distal end of the teat (Steiner et al., 2004).

### **Thickness**

Teat lacerations are classified as being partial thickness (skin to submucosa) or full thickness (skin to mucosa with milk leaking out of the incision). With full-thickness lesions, the defence mechanisms of the teat against mastitis are bypassed, increasing the risk of clinical mastitis. Prompt surgical reconstruction of the injured tissue is needed to protect the quarter against environmental pathogens (Dyce et al., 1996). In cases of incomplete lacerations (when the integrity of the teat cistern has not been compromised), surgical intervention may not be necessary. In that situation, secondary healing by medical management of the wound may be sufficient.

### **Preoperative therapy**

All teat laceration surgeries are considered severely contaminated. Cold hydrotherapy on the injured teat is recommended prior to any surgical interventions, which helps decrease the inflammation and helps clean the teat for surgery. Before surgery, the cow is given a preoperative dose of antibiotic (procaine penicillin 22,000 IU/kg intramuscularly twice a day) and an NSAID (flunixin meglumine 1 mg/kg intravenously). The surgery can be performed in lateral or dorsal recumbency. Lateral recumbency is preferred because it decreases bloating on animals that have not been fasting. However, dorsal

recumbency decreases the milk contamination improving the view of the surgical field. A clean area that will allow tying the animal's leg and that will provide sufficient lighting is selected. A combination of drugs (neuroleptanalgesia) is preferred rather than using only an alpha-2 agonist that worsens bloating in ruminants. A combination of xylazine (0.02 mg/kg), ketamine (0.04 mg/kg), and butorphanol (0.01 mg/kg) is given IV or IM.

Nervous animals can be given higher doses of ketamine (up to 2 mg/kg IM) during surgery. The animal is then cast down, and the legs and head are tied. The side on which the animal will lie is selected according to the location of the laceration. The mammary gland is shaved, cleaned, and scrubbed. A local block is performed with 2% lidocaine HCL. A "V" block or a ring block is performed at the base of the teat. The teat cistern can be infused with lidocaine to anesthetize the mucosa.

### **Surgery**

#### **Surgical materials**

A scalpel handle and a number 10 surgical blade are needed for debridement. A small-size Metzenbaum is appropriate to trim necrotic or redundant tissue. An Adson or Brown-Adson thumb forceps is needed for careful manipulation of the tissue. Using forceps with teeth at the tip causes less trauma than atraumatic forceps (DeBakey or Cooley), which crush the tissue on a greater surface during manipulation (Bailey, 2006). If possible, the tissue should not be manipulated with forceps at all. A small-size needle holder and a regular size Mayo scissor should be part of the teat surgery kit.

A teat cannula, a syringe and some flushing solution should be available. Absorbable suture

material of size 3.0 to 4.0 mounted on an atraumatic needle should be available for suturing the mucosa and the subcutaneous layers. Polyglycolic acid or polyglactin 910 are frequently used. When delayed healing is suspected or when clinical mastitis is present, a slow absorbable monofilament like polydioxanone may be more appropriate. Non absorbable monofilament of size 2.0 should be available to close the skin.

### **Wound debridement**

The wound is carefully but aggressively debrided and lavaged. All the necrotic tissue is removed by scraping the tissue with a scalpel blade until viable tissue is exposed (pink and diffuse bleeding of the tissue). The margin of the skin may need to be trimmed using the scalpel blade or scissors.

### **Laceration repair**

If involved, the mucosa and the submucosa are first reconstructed. A linear defect is reconstructed using a simple continuous pattern with a synthetic absorbable suture material of size 3.0 or 4.0 mounted on a swaged-on atraumatic needle (Grymer et al., 1984; Makady et al., 1991; Ghamsari et al., 1995). With complex configurations, a simple interrupted pattern may be used. If delayed healing is suspected (extensive transverse laceration, mastitis), a slow resorbing monofilament suture (PDS II) is the preferred material to use (Nichols and Anderson, 2007).

The muscular and subcutaneous layers are closed with a simple continuous pattern with a synthetic absorbable suture material of size 3.0 or 4.0 (Grymer et al., 1984; Makady et al., 1991; Ghamsari et al., 1995). With large skin flaps, it is recommended to place some walking sutures (Fig. 1) to decrease dead space. However, doing so will



increase the surgical time and the foreign material and may compromise the vascularization of the teat. Care must be taken to place only what is necessary to hold the flap safely. The skin is carefully apposed with 2.0 synthetic non absorbable monofilament suture material using a simple interrupted or cruciate pattern (Grymeret al., 1984; Makadyet al., 1991; Ghamsariet al., 1995). Care is taken to leave the skin sutures slightly loose because swelling is expected at the surgery site. When severe postoperative oedema is suspected (transverse or chronic laceration), vertical or horizontal mattress sutures around or through stenting material (IV drop set) can be used to decrease risk of wound dehiscence. With complex lacerations, a "V" flap will need to be sutured. However, dehiscence of the tip of the flap often occurs. A corner suture or a three-point buried mattress suture can be placed (Bailey, 2006).

because of the enzymatic reaction associated with its degradation.

### Postoperative care

The wound is protected with a teat bandage, and the quarter is treated appropriately for mastitis. An NSAID (flunixin meglumine 1 mg/kg IV, once a day for 3 days) and antimicrobials (procaine penicillin 22,000 IU/kg IM twice a day for 3 days) should be continued postoperatively. Depending on the severity of the lesion and the structures involved, milking with the machine may or may not be used at the following milking. A larger teat cup is recommended if a machine is used. Hand milking should be avoided because it is associated with wound dehiscence. If the machine is not used, a cannula is introduced carefully at every milking. When the streak canal is involved in the laceration, a cannula with a lid can be left in the streak

after the surgery. If the sutures are left in place longer, excessive fibrosis and suture tract infection may occur (Couture and Mulon, 2005).

### Complications and prognosis

Complications after surgical reconstruction of a teat laceration are wound dehiscence, fistula formation, mural abscess, teat cistern fibrosis, and mastitis (Ducharme 1987a, b). If dehiscence occurs, the teat should be allowed to heal by second intention before attempting to repair. A fistula should be closed after complete healing of the laceration. The dimension of the fistula will decrease, and the surgery will be performed in healthy tissue. A mural abscess can be diagnosed with ultrasound scan. If small, it can be removed "en bloc" or it can be lanced and allowed to heal by second intention. If the mucosa of the teat cistern cannot be closed, fibrosis of the cistern will occur. In this situation, a silicone implant can be placed in the cistern to avoid adhesion formation during the healing of the mucosa. Finally, especially when the distal end of the teat is involved (loss of the protective mechanisms against mastitis), clinical mastitis can become evident after teat laceration repair. Frequent milking and antibiotic therapy should be started. If possible, bacterial culture and antibiotic sensitivity should be performed.

### Summary

Prompt surgery, aggressive debridement, careful reconstruction of the tissue, judicious use of suture materials, and appropriate postoperative therapy and monitoring are all key points to be successful in teat laceration surgery.

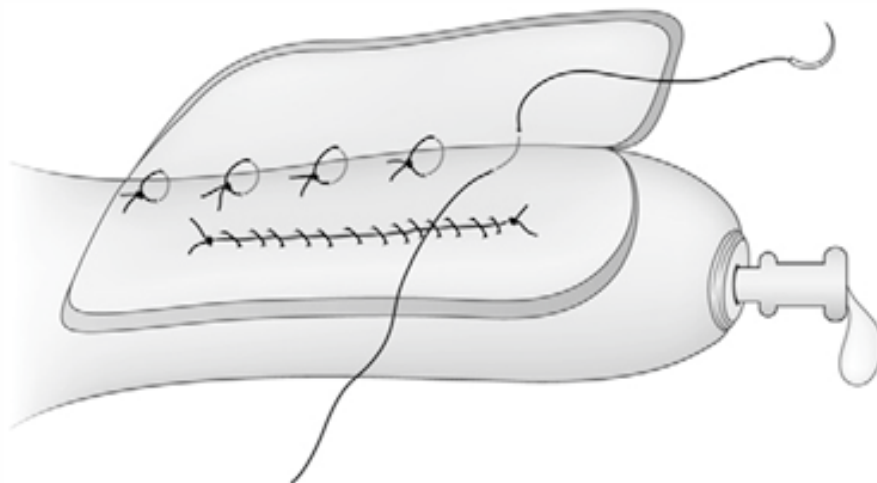


Fig. 1: Walking sutures

Throughout the procedure, the surgery site is lavaged frequently with saline. Antibiotics (cefazolin (1 g/L)) can be added to the lavage solution. Hemostasis is performed to avoid formation of mural hematoma that may obstruct the teat cistern during machine milking. Chromic catgut is not recommended in teat surgery

canal for a few days (no more than 3 days). When the cannula is removed, a natural teat insert (wax implant) can be placed in the streak canal between milkings. It will promote the healing of the damaged streak canal. Severe postoperative oedema can be treated by applying ice around the teat for a few days. The skin sutures are removed no more than 9 days

# Dairy By-products and it's Utilization



**Bhagwati Ninama, Pranav Chauhan and Narendra Kumar Nayak**

Department of Livestock Product Technology,  
College of Veterinary Science and Animal  
Husbandry, (NDVSU), Mhow, Indore (MP)  
453446, India

## Introduction

There are many problems arises while manufacturing of major dairy products among which one major is of utilization of dairy by-products. Due to the unique nutritional value its proper utilization have major role through most profitable ways. Especially in developing countries where shortage of milk is more so conversion of it in the most nutritious food is paramount importance. It is realized economic disposal of by-products is one of prerequisite of profitable dairying.

## Definition

'A Dairy by-product may be defined as a product of commercial value produced during the manufacturer of a main product.'

## Classification

(A) By-products of Western dairy industry-

Main product	By-product
Cream	- Skim milk
Butter	- Butter milk
Cheese, Casein	- Whey

(B) By products of Indian dairy industry-

Main product	By-Product
Ghee	- Lassi (Ghee residue)
Chhana/Paneer,	
Cheese, Casein	- Whey
Cream	- Skim milk
Butter	- Butter milk

## Methods of Utilization

The utilization of the various by-products resulting from the manufacture of different products.

### (1) Skim milk

Skim milk is made when all the milk fat removed from whole milk.

Composition of skim milk - water- 90.6%, Fat - 0.1%, SNF - 8.7%, protein- 3.6%, Lactose - 5.0%, Ash- 0.7%. It's use in the standardization

of milk, cream etc.

### A) Flavoured milk

Flavoured milk are milk to which some flavours have been added.

Flavoured milk fat level is lower than 1-2%.

**B) Cultured buttermilk** - This is obtained by inoculation and incubation of pasteurized skim milk with lactic starter.

**C) Acidophilus milk** - Acidophilus milk is a probiotic drink; this type of fermented milk is produced by development in milk or a culture of *Lactobacillus acidophilus*.

Acidophilus milk has therapeutic and health - promoting properties.

### D) Condensed skim milk

Condensed milk are the product obtained by evaporating part of the water of whole milk or fully or partly skimmed milk, with or without the addition of sugar.

According to PFA rules (1976) the various condensed skim milks have been specified-

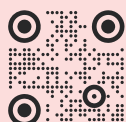
Unsweetened condensed skim milk (evaporated skimmed milk) - contain 20.0% total milk solids and 0.5% Fat.

Sweetened total milk solid and 0.5% Fat and 40.0% cane sugar. Condensed skim milk - contain 26.0%.

### E) Skim milk Cheese

Cheese is the milk product obtained by draining after the coagulation of milk with a harmless milk coagulating agent, under the influence of harmless bacterial culture. It contained 43.0% moisture and 42.0% milk fat.

Some examples of cheese made from skim milk - Cottage cheese, Baker's cheese, Gammelost cheese, Sapsago cheese etc.



## F) Casein

Casein is the most important protein component in milk, both quantitatively and nutritionally. Found in form of a calcium caseinate-phosphate complex. It forms more than 8% of the total protein in milk.

Important utilization of skim milk is in the production of industrial casein (non-food item).

There are two types of industrial casein - Acid casein and rennet casein.

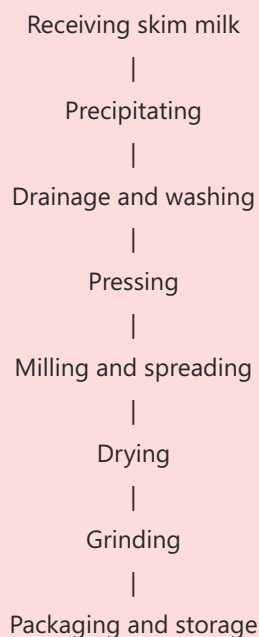
Acid casein - It has, faint pleasant odour, slightly acidic taste, pH about 5.2 and 10.0% moisture, fat - 1%.

Uses of acid casein - Leather finish, textile finish, spreader of insecticide etc.

Rennet casein - It has a faint agreeable odour, tasteless, pH about 7.0 and moisture 10.0%.

Uses of rennet casein - Plastics such as buttons, costume jewellery and umbrella handle etc.

### Method of manufacture of casein



### Edible Casein

Edible casein may be defined as casein which has been isolated from skim milk by taking special precautions to ensure its suitability for use in patented food and pharmaceutical preparations.

### Special precautions taken should be -

- I) Precipitation of the curd at pH 4.1-4.3.

- ii) At least 3 separate washing of the curd in waters of proper pH, with contact time 15-20 min.
- iii) One washing with hot water at 71-77°C (160-170°F), which effects pasteurization of curd for reducing bacterial count.
- iv) Last washing with neutral water at 41°C (105°F).

Edible casein is used in various food products like- icecream, coffee whiteners, whipping powders etc.

### (2) Buttermilk

Buttermilk is the slightly sour liquid left after butter has been churned, used in baking or consumed as a drink. Composition of buttermilk - water - 91.0%, Fat - 0.4%, protein - 3.4%.

### It can be utilized in preparation of-

- A) Condensed buttermilk - also known as semi-solid buttermilk. 5-6% acidity necessary for long keeping quality.
  - B) Dried buttermilk
  - C) Soft cheese from buttermilk etc.
- (3) Whey

The whey obtained as a by-product of cheese industries has long since been employed in the production of fermented beverages, both alcoholic and Non-alcoholic (acidic).

- I) Utilization of whey in the production of a soft drink called whevit.
- ii) **Yeast-whey** - This is a newly developed product. food supplement rich in proteins and vitamins.
- iii) **Whey paste** - Pre-concentrating a mixture of whey and skim milk in a vacuum evaporator, and adding sugar syrup, butter and cream so as to obtain 15% sugar, 15%fat, 65%total solids in products.
- iv) **Lactose**

lactose or milk sugar is true solution in the milk serum. It is one-sixth as sweet as sucrose.

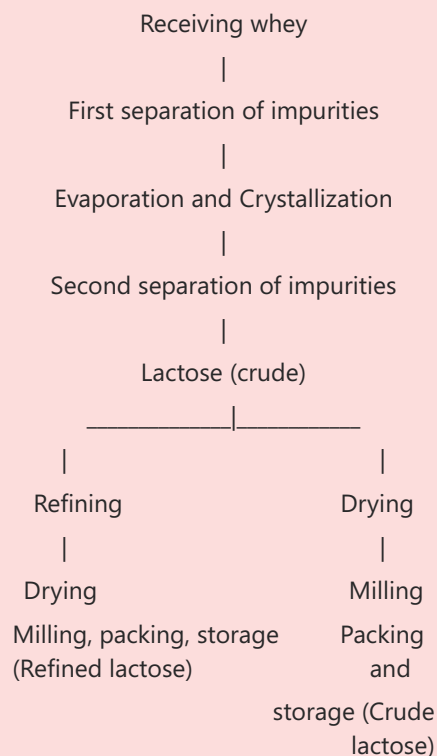
Lactose is responsible, under certain conditions, for the defect known as "sandiness " in ice cream

and sweeten condensed milk.

### Uses -

- (I) In the preparation of humanized milk
- (ii) In infant food
- (iii) In solid pharmaceutical preparations such as pills and tablets.

### Method of manufacture



### (4) Lassi

It also called chhas or matha, refers to Desi buttermilk, which is by-product obtained when churning curdled whole milk with crude indigenous devices for the production of desi butter (makkhan).

It is largely consumed by the producer's household after seasoning it with salt or sugar.

Composition of Lassi - water - 96.2%, Fat - 0.8%, Solid-not-fat - 3.0%, protein - 1.4%, Lactose - 1.2%, Ash - 0.4%.

### (5) Ghee-residue

It is also known as sweet cream butter.

This is a nutritious food containing fat (61.4%), water - 9.7%, desaturated protein, burnt lactose and minerals.

It can be utilized in the preparation of candy and chocolate.



# Prospects of Self Employment in Dairy Goat Farming with Special Reference to the North-Eastern Region of India



**Deepandita Barman<sup>1</sup>, Arunoday Das<sup>2</sup> and Pallabi Pathak<sup>3</sup>**

<sup>1</sup>Assistant Professor, LPM, <sup>2</sup>Assistant Professor, ARGO Department, LCVSC, Assam Agricultural University, <sup>3</sup>Assistant Professor, ARGO Department, LCVSC, Assam Agricultural University

## Introduction

The goat is known as the 'poor man's cow' in India because of its significant contribution to the economy of the poor. They not only provide nutritious and digestible milk but also a common source of income for poor, landless, small land farmers. Being small animals, goats can be easily handled by women and children. rearing, feeding, milking, housing and caring for goats does not require much advanced equipment and hard work. Money investments and food costs are also very low. Goat has early

sexual maturity, higher prolificacy rate and easily marketing with profit. Goats can be successfully farmed in areas where fodder is limited and milking cows do not grow well. A return of up to 50% money is possible in goat farming. Small land farmers and landless labour that are not suitable for rearing of other species such as cattle, buffalo but goat is the best option for them four goats can be kept cheap as one traditional cow.

In rural areas, goat farming plays an important role in providing self employment to people. Goat rearing





turned out to be a very good source of income for the landless as well as the landowners. The wide variety of genetic diversity of Indian goat breeds enables them to survive under stressful natural conditions, including high disease, malnutrition and high temperatures. Goat farmers can get the most profit by selling pure breeds of goats and special occasions such as Eid. Rural unemployment people take training about scientific farming of goats, also develop their management skills for proper housing, feeding including fodder development for goats and their conservation, proper breeding skills, disease control, prevention, value addition of goat milk and meat products. Goat insurance is the best protection

against mortality risk, especially for small producers of farmers. Encourage goat farmers to switch extensive goat farming to semi extensive system. (Khillare and Kaushal, 2021).

**Risk management and insurance coverage, backward and forward linkages to start goat farm.**

**1. Common conditions**

- (a) Goat insurance covers sudden and unexpected death of animals. The common conditions are: flood, fire, lightning, explosion, storm, typhoon, hurricane, riots, surgical operations.
- (b) Earthquake and landslide are provided
- (c.) Animals are identified by ear tags of small brass buttons

**2. The bank/financial institution providing insurance for goat farming**

- (a) SBI General Insurance Company Limited with the total capital of about 74%
- (b) New India Insurance Company Limited
- (c.) The Oriental Insurance Company Limited

- (d) United India Insurance Company
- (e) IDBI Bank Limited

Premium rates of basic is 4% gross per annum. (Rs. 30/- per policy)

**3. Goat breeding policy**

The main motto is to improve growth, reproduction efficiency, quality and quantity of meat and wool and to reduce mortality considering the cross breeding with high yielding exotic and native breeds of goats.

1. Goat Sukshma Bima Policy: It includes accidents as discussed above or any acceptable diseases such as rinder pest, black quarter, haemorrhage died within any geographical area. Septicemia, Antrax, FMD, goat pox fall under the policy.
2. Veterinary Examination for identification marks, animal health and immunizations can be obtained.
3. The company will bear the tagging charges which do not exceed Rs. 1/- per animal at the time of approval of proposal.
4. The following routine vaccination schedule should be adopted:

Months	Vaccine	Adult Goat	Kids (above 6 months)
January	Contagious pleuro pneumonia (C.C.P.P)	0.2 ml I/dermal	0.2 ml I/dermal
March	Haemorrhagic Septicaemia	5 ml S/c	2.5 ml S/c
April	Goat Pox	Scratch method	Scratch method
May	Entero toxaemia F.M.D.	5 ml S/c 5 ml S/c	2.5 ml S/c 5 ml S/c
June	Rinderpest	1 ml S/c	1 ml s/c
July	Black Quarter	5 ml s/c	2.5 ml s/c
August	F.M.D.	5 ml s/c	0.5 ml S/c
September	Enterotoxaemia	5 ml S/c	2.5 ml S/c

# Adulteration of Ghee – A Critical Concern



**Sharanagouda B  
Indu  
Sumit Mahajan  
and Kartik**

## Introduction

India, being a largest and top milk producing country in the world produces around 209.96 MT in 2020-21 with a CAGR of 6.2. Highly consumed and traded Indian milk product next to liquid milk is Ghee. About 28% of total milk produced used for ghee production. According to FSSR-2011, ghee means the pure heat clarified fat derived solely from milk or curd or from desi (cooking) butter or from cream to which no colouring matter or preservative has been added. Ghee made from cow's milk is high in fat-soluble vitamins and omega-3 fatty acids. According to Ayurveda, ghee is an important constituent used for Ayurvedic medicines as it is good for health and helps in growth. Apart from this, it detoxifies the whole body and provides nutrition. Demands of ghee is increasing day by day but due to lack of supply chain management system especially in summer season the producers or the middle-men involved in the ghee trade, tend to adulterate ghee with cheaper oils and fats like vegetable oils, animal body fats, hydrogenated fats and sometimes even the non-edible mineral oils. In comparison, vegetable ghee is not that great in taste and is also associated with many long-term health problems. Vanaspati has a high-calorie content than cow ghee (122.4 calories per tablespoon compared to 85.6

calories in cow ghee). Cow ghee, without a doubt, contains saturated fat and is rich in cholesterol. Vanaspati, on the other hand, contains trans fats, which may have a more negative impact on your health. The market price of ghee is almost 3 times more than the price of edible vegetable oils/ fats. Malpractices of adulteration in ghee with vegetable oil and animal body fat affect so much on our health. Many detection practices or tests are used to detect adulterants. Usually Baudouin test, Furfural test, Reichert Meissl test preferred to check adulteration of ghee.

## What is adulteration?

Adulteration is defined as the process by which the quality or the nature of a given substance is reduced through the addition of a foreign or an inferior substance and the removal of vital elements. Adulterants are substances added to pure substances to extend the quantity while it degrades the quality of product.

## Common Adulterants used

- Various types of starch added in ghee to increase thickening in ghee like potato, sweet potato and other starches.
- Coal tar dyes used for giving colouring to ghee. Coal tar dyes are artificial coloring agents made by combining various aromatic hydrocarbons like toluene, xylene, benzene, which are obtained from the







distillation of bituminous coal.

- Refined/ deoxidized vegetable oils are added to increase the quantity of ghee because it has similar colour and texture. They may be groundnut oil, coconut oil, cotton seed oil, sunflower oil etc. Coconut oil approaches closest to ghee as far as analytical characteristics (high Polenske value and low saponification value, iodine value and BR reading). In respect of physical resemblance, hydrogenated fats (edible vanaspati), particularly groundnut oil, is most preferred. Its melting point is slightly below 37°C, has solid to semisolid consistency and even the characteristic granular appearance of ghee.

- Animal body fat is not as common as vegetable oil/fats. Tallow or other animal body fats obtained from slaughter houses are mixed with ghee in different proportions. The animal body fat being hard cannot be detected visually. By adding animal body fats in ghee, one of the sacred foods, the oblivious ghee traders lacking honesty not only fleece the public, but also play with their religious sentiments, especially of the vegetarian section of the society. The consumption of animal body fat (from red meat) is reported to have adverse health implications.
- Adulteration of ghee with Vanaspati (hydrogenated vegetable oil) was more

rampant and of a substandard quality. Vanaspati is basically hydrogenated oil and contains a high percentage of Trans fatty acids (TFA), which depends on multiple factors and could be as high as 50-60% of total fat content. The vanaspati industry routinely uses hydrogenation process to harden and stabilize liquid vegetable oil. Hydrogenation also helps to maintain the taste of the oil while giving it a longer shelf life; however, unsaturated fat gets converted into saturated fat during processing.

### Health hazards due to consumption of adulterated ghee

- Type 2 diabetes
- Obesity
- Metabolic syndrome or pre-diabetes
- Irritable bowel syndrome
- Inflammatory bowel syndrome
- Macular degeneration (eye damage and blindness)
- Rheumatoid arthritis
- Asthma
- Cancer
- Psychiatric disorders
- Autoimmune diseases
- Heart disease
- Kidney disorders

### Detection of adulteration in ghee

Detection of ghee adulterated with vegetable oils/fats, animal body fats and other adulterants is a key concern at grass root level during processing and marketing. There are various detection methods for checking adulteration in ghee that are:-

- **Heat Test:** In this method we can easily find impurity of ghee by heating a teaspoon of ghee in a vessel. If ghee melts instantly and turns dark brownish, that represent pure ghee. If it takes time to melt and turns into yellow, then it represents contamination.
- **Palm test:** Take a teaspoon of ghee at palm and if ghee melts in your palm by itself, then it is pure. Pure ghee melts on the body temperature.
- **Double-boiler method:** To detect adulteration of ghee with coconut oil, melt the ghee in a glass jar using a double boiler and pour into another glass jar, after cooling to room temperature put the jar in the deep fridge for some time. If ghee and coconut oil solidify in a separate layer, then ghee is adulterated else ghee is pure.
- **Detection of vegetable oil:** In this method, take a teaspoon of melted ghee in a transparent bottle. Add a pinch of sugar, close the container and shake it. Let it stand for five minutes. If a red color appears at bottom of vessels, then ghee contains vegetable oil.
- **Iodine test:** Add a few drops of iodine to teaspoons of molten ghee. If it turns into purple that means ghee contains starch.
- **HCl test:** In this method we heat a tablespoon of ghee in a test tube, and add an equal amount of concentrated HCL (the acid that the stomach uses to digest food) with a pinch of sugar. Shake well and wait for five minutes. The appearance of pink or red color in the lower layer shows the sample is

adulterated with rancid ghee like vanaspati ghee.

- **E-nose method:** The e-nose machines are intended to detect and distinguish between different scents. E-noses (electronic noses) are devices that simulate the sense of smell. These devices typically employ a sensor array to precisely identify and distinguish odours in complex samples at a cheap cost. These characteristics make e-noses extremely valuable in a variety of industries, including food, cosmetics, and pharmaceuticals, as well as environmental control and clinical diagnostics. To distinguish pure cow ghee from contaminated ghee, an electronic nose based on eight metal oxide semiconductor sensors can be use (mixed with sunflower oil and cow body fat). To classify different levels of adulteration, researchers employed principal component analysis (PCA) and artificial neural network (ANN) methods.
- **Baudouin test:** Take 5 ml of melted ghee in a test tube and add 5 ml of conc. HCl and 2-3 drops of 2% furfural solution in alcohol in it. Shake the test tube well. Keep it aside for 5-10 minutes. Vanaspati ghee contains 5% sesame oil. Development of rose-red colour indicates adulteration of ghee with vanaspati.
- **Acrolein test:** The acrolein test is used to determine whether glycerol or fat is present. When fat is heated in the presence of a dehydrating

agent such as potassium bisulphate (KHSO<sub>4</sub>), the glycerol portion of the molecule is dehydrated, resulting in the formation of acrolein, an unsaturated aldehyde with a pungent unpleasant odour.

Other than these detection methods FSSAI recommended a Noval method (2019) to detect vegetable oil adulteration in ghee. FSSAI has directed the food testing laboratories to use the method with instant effect. The order added that the method was applicable to four vegetable oils, viz. soybean oil, groundnut oil, coconut oil and sunflower oil. The method is much simpler and easy to follow, as it is based on the detection of cholesterol and  $\beta$ -sitosterol as markers in the unsaponifiable matter (USM) of pure ghee and adulteration ghee samples.

## Conclusion

Food adulteration, particularly ghee adulteration, has been a severe problem in India in recent years, affecting even infant's food. According to a survey, polluted water and food are responsible for 80% of all premature deaths. Governments should take strict measures against those who engage in this inhumane activity. Lack of awareness provides an opportunity for those who commit adulteration. Hence, the general public should be aware as well. Governments can use mass communication outlets such as radio, television, social networking, billboards, newspapers, magazines, books, film and the Internet to inform the public.

# Feeding Management of Dairy Animal in India

Dairying is an integral part of Indian agriculture and holds a significant place in Indian economy. Animal feed is the food given to animals which are domestic often refers to fodder in the course of care and management of dairy farm animals by humans for profit. Supply of quality feed ensures the health of dairy animals. Feeding is a very important aspect of dairying as it accounts for around 70% of the total cost of milk production. Different types of dietary feed ingredients for dairy cows and buffaloes contain concentrates such as compound cattle feed, oil cakes, grains and their byproducts like brans and chunnies; cultivated green fodders and grasses; crop residues like straws and stovers.

Fodder is a major constituent of animal feed which contributes two-third of the animal feed requirement. It is essential to increase fodder production by increasing area under cultivation to 12 per cent of the total cultivable land and use of high yielding varieties of fodder crops. Farmers need to be educated and trained on conservation and preservation of fodder which can be used during the scarcity for sustainable milk production.

## Fodder varieties and production

**Green fodder:** Main source of carbohydrates and crude fiber. Includes Bermuda (buffalo grass),

Canchrus sps, Napier grass, Congo signal, Fodder sorghum, elephant grass, Sudan grass etc.

**Legume:** includes Cowpea, horsegram, lucerne, barseem, green gram, black gram, Shanka pushpam (Aparajita – Clitoria ternatea), phillipasara (Phaseolus trilobus), Daincha (Sesbania bispinosa).

**Fodder Trees:** Subabul, glycericidia, Drumstick, Neem, Sesbania grandiflora, Sesbania sesban, Acacia sp, Melia dubia.

Dairy animal needs food 2.5 to 3.5% of its body weight. In other words, a buffalo needs 30 kilograms and cow needs 25 kilograms of food including concentrates. It should have 60% wet and 40% dry fodder. Out of total green-wet fodder 25% must be from leguminous species and 75% from monocot grasses. Dry fodder is a must even if we have surplus of green fodder. Feeding only green will affect the growth of the animal and yield and quality of milk. Do not use paddy straw as dry fodder.

Ruminants need a daily supply of all nutrients required for maintenance and production that are milk, growth, and pregnancy. Quantitatively any type of nutrient can limit performance levels, but the most probable to be in short supply are energy and protein, this is especially true for high and average



<sup>1</sup>\*Suvidhi, <sup>2</sup>Sudesh Kumar, <sup>3</sup>Anil Choudhary, <sup>4</sup>L N Sankhala

<sup>1</sup>\*Senior Research Fellow, ICAR-National Research Centre on Equines, Hisar, Haryana, 125001, <sup>2</sup>Senior Research Fellow, National Centre for Veterinary Type Cultures, ICAR-NRCE, Hisar, Haryana, 125001, <sup>3</sup>M.V.Sc. Scholar, Department of Veterinary anatomy, <sup>4</sup>Assistant Professor, Department of Veterinary Pharmacology and Toxicology, College of Veterinary and Animal Science, Bikaner-334001, Rajasthan



Fig1. Green fodder for dairy animal (Picture: Dr. Sudesh Kumar)





yielding cows. Both energy and protein should be considered. For energy, the feeding organism uses the metabolizable energy (ME) in the feed as a basis to formulate rations. The metabolizable energy is the energy remaining in the digested foodstuffs after the loss in feces, urine, gases and body heat.

**Carbohydrates:** Primary sources are barley, corn, oats, wheat, molasses, beet pulp, and soy hulls. Most dairy farmers produce their own barley, corn, oats, and wheat and will often process these grains to be fed to the cows. Molasses, beet pulp, barley, and soy hulls are purchased from a feed mill. Not all of these carbohydrate sources are used as other sources are required to complement the forage to meet the nutritional requirements of the cows.

**Protein:** Primary sources are canola meal, distillers grains, soybean meal, and corn gluten meal.

**Fat:** Primary sources are vegetable oil, tallow, and protected fatty acids.

**Minerals and Vitamins:** Primary sources are Calcium, Phosphorus, Magnesium, Sodium, Chloride, Potassium, Sulfur, Iron, Zinc, Manganese, Copper, Cobalt, Iodine, Selenium, Vitamin A, Vitamin D, E, and some B-vitamins too. They are necessary for the health and productivity of the cows and farmers and nutritionists will make sure all of these nutrients are balanced. Prebiotics and probiotics are often used to help with digestion and as another way to ensure cows are healthy.

### Balanced ration

It is a ration which supplies all the essential nutrients to the animal in required proportion, form and quantity for 24 hours. Desirable characteristics of good ration are as follows.

- Ration should be properly balanced with all necessary nutrients.
- Ration should include variety of feed stuffs so as to provide better nutrient composition to the body.
- Ration should include sufficient green fodders preferably legumes.
- Ration should include palatable and

digestible feedstuffs so as to ensure optimum feed intake and maximum nutrient availability. As they may reduce the nutrient availability leading to health disorders.

- Ration should satisfy the total dry matter requirement of an animal based on weight.
- Ration should be fairly bulky as it is required for satisfaction of hunger and expulsion of undigested material due to its laxative action
- Ration should be fresh and free from undesirable weeds and dust.
- Ration should be properly processed to ensure its desirable intake.
- Ration should be economical as feed accounts to about 60 – 70 % cost of animal rearing.

### Thumb rule for cattle feeding

- The average DM (Dry matter) requirement of desi cow is 2 (dry) to 2.5 (lactating) Kg. / 100 Kg. body weight / day while it is 2.5 (dry) to 3.0 Kg. (lactating) in cross breed cows and buffaloes.

- The roughage requirement is fulfilled through green and dry fodders, about 2/3 of DM through dry fodder and remaining 1/3 from green fodder

- The concentrate requirement of animal for maintenance production and pregnancy is as follows:

- o Maintenance requirement of desi cow and crossbred cow / buffalo is 1 and 1.5 Kg. respectively.

- o Lactating animal should be given 1 Kg. additional concentrate for every 2.5 Kg (Buffalo) to 3 Kg (Cow) milk produced.

- o Pregnant cows, buffaloes should receive 1.5 Kg. per day extra concentrate allowance during advance pregnancy to meet extra need of nutrients for growth of fetus.

- o Breeding bulls in service should get 1 Kg. per day extra concentrate. Allowance to maintain good health and sex libido.

- Mineral mixture and common salt



Fig 2. Cattle feeding green and dry roughage fodder (Picture: Dr. Sudesh Kumar)

each @ 25-50 gm should be given to fulfill mineral requirement of animal.

### Maintenance ration

- It is minimum allowance of ration given to the animal for carrying out its essential body processes at optimum rate without gain or loss in body weight.
- It is usually given to dry non-producing animals. It roughly satisfies the nutrient requirement for maintenance.
- Gestation or Pregnancy Ration It is the allowance of ration given to the pregnant animal in addition to maintenance ration during the last quarter of pregnancy.
- It is given to satisfy nutrient requirement of pregnant animals. It is required for optimum fetal growth.
- It helps in proper development of udder for future lactation.

### Production ration

- It is the additional allowance of ration given to the animal over and above the maintenance ration for the purpose of production like milk, meat, wool and work.
- It is given to meet the nutrient losses through milk.
- It helps to maintain milk production to optimum level.

### Compound cattle feed

- Compound cattle feed is a mixture of various concentrate feed ingredients in suitable proportion.
- Commonly used ingredients in compound cattle feed include grains, brans, protein meals/cakes, chunnies, agro-industrial by-products, minerals and vitamins.
- Compound cattle feed is an economical source of concentrate supplements and it could be in the form of mash, pellets, crumbles, cubes, etc.
- Compound cattle feed is palatable and good source of nutrients for growing, adult, dry, milk producing

and pregnant animals.

- Through regular use of compound cattle feed in prescribed quantity along with basal diet, cost of milk production from dairy animals can be optimised and net profitability can be increased.

<b>Compound cattle feed needs to be fed as follows:</b>		
Particulars	Cows (400 kg body wt.)	Buffaloes (500 kg body wt.)
For maintenance	1.5 - 2.0 kg	2.0 - 2.5 kg
For milk production (per litre)	400 grams	500 grams
For pregnancy	2.0 kg (last two months)	2.0 - 2.5 kg (last two months)

Considering the increase in milk yield, regional variation in feed availability, preference of farmers it is required to produce different varieties of compound cattle feed.

### Challenge feeding

Challenge feeding means the cow with high milk production potential are to be fed increase quantity of concentrate to 'challenge' them to produce to the maximum. This starts two weeks before expected date of calving. This challenge feeding will condition her digestive system for the increased amount of concentrate and provide enough nutrients to initiate lactation on a higher plane. Two weeks before the expected date of calving start feeding 500 g of concentrate mixture. The quantity should be increased daily by 300-400 g until the cow is consuming 500-1000g concentrate for every 100 kg body weight.

After calving, the concentrate allowance should be increased by 500 g per day in the first 2 weeks of lactation until the cow achieves peak yield somewhere in the second month

<b>Challenge feeding schedule:</b>	
Period	Concentrate allowance
Last 2 weeks before calving	Starting from 500g, increase 300 - 400g daily until the cow is eating 500 - 1000g per 100kg body weight.
First 2 weeks of lactation	Increase 500g per day to free choice level.
Second week to peak yield (test day)	Free choice
From test day onwards	According to production as per thumb rules. E.g. 1Kg for every 21/2 kg milk produced
Remaining lactation	Concentrate adjusted to monthly test of milk Production
All periods	Green fodder and dry fodder given adequately

of lactation on free choice basis. After this the milk yield is tested and the concentrate allowance is fixed accordingly.

### Calf nutrition

- Proper management of young calf

is prerequisite to the success of any dairy farm.

- An optimal level of nutrition in early life favors faster growth and early maturity.
- Calves should be reared carefully to obtain optimum gain in body weight, so that they attain about 70-75 percent of mature body weight at puberty.
- Poor feeding of young calves leads to higher age at first calving and overall loss of productivity in the life span.

### Important aspects of calf feeding:

- Colostrum feeding within half an hour of birth
- Feeding whole milk/ milk replacer to calves
- Introduction of calf starter/good quality grain from 2nd week onwards
- Good quality hay should also be given to calves
- Deworming and vaccination

# Anestrus : A Major Infertility Issue of Dairy Animals



**Anmol Pareek<sup>1</sup>, Sandeep Kour<sup>2</sup>, Asma Khan<sup>3</sup>, Biswajit Brahma<sup>4</sup>, Dipanjali Konwar<sup>4</sup>**

<sup>1</sup>M.V.Sc Scholar, <sup>2</sup>Ph.D., <sup>3</sup>Professor and Head, and <sup>4</sup>Professor, Division of Livestock Production Management, F.V.Sc&AH, SKUAST- Jammu

Anestrus is a transient pause of the reproductive cycle marked by the lack of estrus signals. Anestrus is a multifacet problem but its incidence indicates improper nutrition, stress from environment, uterine pathology and improper management. The incidence of anestrus is more in buffalo compared to cattle. High milk production is desired in dairy enterprise which is achieved when all animals have regular reproductive cycle and good fertility. Skip in one estrus cycle cause loss because inter-calving interval increases and there will be a longer dry period and shorter Lactation length. Anestrus causes an estimated loss of Rs. 193 per cow reported by Pawshe et al. (2011) and in buffalo it is Rs. 372.90 per buffalo reported by Kumar et al. (2013). This article highlights on major causes of anestrus and the management of anestrus condition.

## Factors affecting anestrus

**Nutrition:-** Malnutrition or under nutrition is the most common cause of anestrus in heifers, in tropical countries poor quality feed and shortage of feed is the probable reason for malnutrition. In high yielding animals due to high metabolic load nutrients are utilized for production instead of reproduction. Vitamins like Vitamin A, Vitamin D, Vitamin E

and minerals like calcium, phosphorus, copper, zinc and iron play significant role in action of enzymes and hormones, deficiency of minerals affect reproductive performance. Not only underfeeding cause anestrus but overfeeding also leads to anestrus, high feed intake causes high metabolism which promotes clearance of ovarian hormones from body.

**Body condition score:-** Body condition score reflects the nutritional status of animal and a major factor affecting reproductive performance. A desirable body condition score is 3.5(On scale of 5) at time of calving. Less feed consumption during late gestation and early parturition reflects low body condition score and it cause prolonged postpartum anestrus.

**Environmental stress:-** Extreme hot and cold affect follicular development and affect reproductive cycle in both cattle and buffalo. Reduced feed intake in summer results in low level of gonadotropin secretion. Heat stress also affect quality of oocyte, folliculogenesis and micro environment of follicular fluid.

**Lactation :-** Prevalence of anestrus is seen in high yielding cattle and buffalo. High level of oxytocin hormone provides





negative feedback on GnRH-LH axis.

**Suckling:-** Ovarian activity gets suppressed by suckling after parturition resulting in a delay in postpartum estrus. Suckling induces secretion of prolactin, oxytocin and cortisol which provide negative feedback on GnRH-LH axis. These hormones suppress GnRH secretion and ultimately reduce LH pulse frequency.

**Parasitic infections:-** Parasitic load is one of the common causes of anestrus among dairy animals. Parasitic infections like trypanosomiasis, fasciolosis and schistosomiasis cause weight loss and anemia which leads to anestrus. Parasitism also affects future productive and reproductive performance.

**Genotype :-** The restarting of postpartum cyclicity depends upon species and breed. The postpartum anestrus of buffalo is longer compared to cattle. The role of genotype is not completely known but it may be due to difference in physiology of different species and breeds, difference in feed intake and milk production.

**Parity :-** Longer postpartum anestrus is observed in primiparous buffaloes than pluriparous buffalo. As the parity increases, the length of postpartum anestrus decreases.

**Periparturient Disease:** Abnormal calvings and disease like Metritis, Ketosis, Mastitis also influence onset of postpartum cyclicity. Inflammation affects secretion of GnRH and LH thus activity of ovary remains suppressed in uterine infection.

**Increased milking frequency:-** Increasing the frequency of milking from twice to three or four times daily lengthens the interval from calving to first ovulation by less than a week. When milking frequency is increased from three to six times daily, the interval to first ovulation is lengthened, but still not to the same extent as that of frequent suckling. Therefore, increased milking frequency is only a minor contributor to anestrus.

**Efficiency of estrus detection:-** Unobserved estrus due to poor estrus detection efficiency can frequently contribute to anestrus, exacerbating the severity of the condition.

**Negative energy balance:-** Cows in negative energy balance are at a very high risk of anestrus and delayed onset of cyclicity. Elevated circulating concentrations of nonesterified fatty acids are associated with adipose tissue mobilization and indicative of negative energy balance.

**Housing type:-** Cows under intensive housing systems compared with those on pasture have a higher risk of anestrus. Tie-stalled cows are more likely to be in anestrus than other types of housing because tie-stalled cows have few opportunities to form sexually active groups, limiting overt behavioural signs of estrus.

#### **Management of anestrus**

The best management of anestrus is to identify animal and management of predisposing factors. Various hormonal and nonhormonal compounds are used to restore cyclicity in animals. Plant based treatment has been used since long ago. Various parts

of plants like root, bark, flower and leaves have active principles and some parts of plants are rich in minerals and vitamins which helps in restoration of cyclicity. Examples of such plants are curry leaves, kalonji, ashoka, methi, papaya and cucumber. These plant-based medicines are used singly or in combination to treat anestrus. Other method like utero-ovarian massage is cheapest, oldest and effective method to induce cyclicity. The probable mechanism of this method is increased blood circulation in ovary and uterus which increase availability of hormones. Uterine infections can be treated by flushing uterus by lugol's iodine solution. Painting of cervix by lugol's iodine solution cause irritation and bring out reflex to secrete GnRH from anterior pituitary. Various hormonebased medications used to treat anestrus. GnRH, prostaglandin, estrogen and progesterone are used alone or in various protocols to treat various ovarian dysfunction. To assure effective treatment, nutrient and health status of animal must be good, only deworming is not sufficient. Vitamin, mineral and antioxidant supplementation helps to achieve good health status in animals. Estrus detection and artificial insemination in animals should be done by trained workers as efficiency of estrus detection and insemination in animals also plays an important role in anoestrus condition. Further the animals should be prevented from negative energy balance and should provide with proper housing and space requirement to exert maximum reproductive efficiency.

# Food Waste to Energy



**Indu Panchal, Sharanagouda B., Sumit Mahaja, and Kartik Alwa**  
College of Dairy Science and Technology, LUVAS, Hisar – 125004.

Food waste is a biodegradable waste discharged from various sources including food processing industries, households, and hospitality sector. As per the UN Environment Programme (UNEP) report, UN Food Waste Index Report 2021, globally, the average annual wastage is 121 kg a person. Of this, the share of food wasted in domestic households is 74 kg. China came first with an estimated 91.6 million tonnes of discarded food annually, followed by India's 68.8 million tonnes. According to this report 50 kg of food is thrown away per person every year in Indian homes. According to the ministry of consumer affairs, food and public distribution, 11,520 tonnes of food grains were wasted in the past four years due to poor maintenance. Among south Asian countries, the highest amount of food is wasted in Afghanistan (82 kg per person per annum) followed by Nepal at 79 kg, Sri Lanka at 76 kg, Pakistan at 74 kg and Bangladesh at 65 kg. India is at the bottom in terms of food wastage.

Proper management and recycling of huge volumes of food waste are required to reduce its environmental burdens and to minimize risks to human health. Utilization of food waste for energy conversion currently represents a challenge due to various reasons. These include its inherent heterogeneously variable compositions, high moisture contents and low calorific value, which constitute an impediment for the development of robust, large scale, and efficient industrial processes. Incineration

of food waste consisting high moisture content results in the release of dioxins which may further lead to several environmental problems. Also, incineration reduces the economic value of the substrate as it hinders the recovery of nutrients and valuable chemical compounds from the incinerated substrate. Appropriate methods are required for the management of food waste. Anaerobic digestion can be an alluring option to strengthen world's energy security by employing food waste to generate biogas while addressing waste management and nutrient recycling.

**There are various ways to utilise Food waste that are as follows;**

1. Anaerobic digestion
2. Sanitary landfills
3. Incineration
4. WtE (waste to energy)Technology
5. Hydrothermal Carbonisation
6. Dendro Liquid Energy

• **Anaerobic digestion (AD)**

Anaerobic digestion is a biochemical process that takes feedstock and places it in a reactor in the absence of oxygen to create biogas and digest. To do that, reactors are rich in microbial communities that serve to break down the feedstock. It uses more agricultural waste and synthesizes waste that has higher water content through a series of microbial processes to generate biogas. Heat generation can be increased by 90% when



Fig 1. Schematic representation of house hold food wastage in the world.



syngas/methane is combusted in a cement kiln. Combined heat and power (CHP) WtE plants can have an efficiency of 40% if utilized suitably. The process has lesser cost and low residual waste production and utilization of food waste as renewable source of energy.

• **Sanitary Landfills**

Sanitary landfills operate by layering waste in a large hole. There are different levels of layering of waste to facilitate the decomposition of the materials as well as trap toxic gases released from the process. The layers are made in a way that the bottom part has the smallest volume, with the top part taking the bigger volume to avoid collapsing of the land.

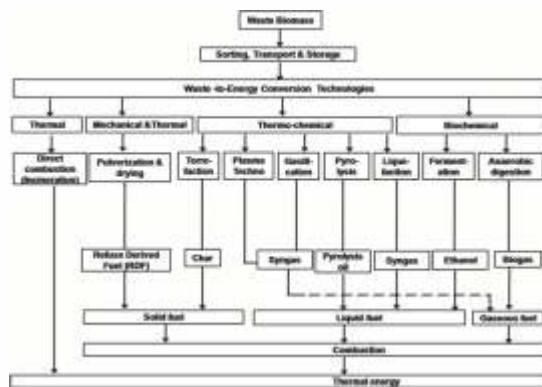


Fig 2. Schematic representation of food waste conversion methodologies to energy

• **Incineration**

Incineration is considered when the calorific value of the input feed is at least 7MJ/Kg. When there are no complex collection techniques or when the water content is higher, biochemical methods need to be taken into account. Conversion of thermal energy from incineration can be used to drive a steam turbine for electricity, but only with 15-27% efficiency. Gasification produces syngas that is easily combustible in a gas turbine/engine to generate electricity, which is about 30% efficient.

• **Waste to energy (WtE) Technology**

WtE technology is an energy recovery process that converts chemicals from waste residues into practical forms of energy like electricity, heat or steam. As of now, thermal conversion techniques lead the market among WtE technologies. MSW (Municipal solid waste) has really low calorific value and directly incinerating it will not generate adequate thermal energy. So, pre-treating MSW into refuse derived fuel (RDF) is more effective.

• **Hydrothermal Carbonisation**

Hydrothermal Carbonization (HTC) that fast-tracks the slow process of geothermal conversion of wet waste with an acid catalyst at high pressure and heat to simulate the production of 'hydro-char' that has properties similar to fossil fuels. The main advantages of this to Anaerobic digestion is the lower processing time and similar operating conditions needed to generate the same amount of energy. It is one of upcoming technologies of world. Hydrothermal Carbonization (HTC) is a thermo chemical process that turns organic waste into structured carbons similar to fossil fuels (that take up to millions of years to form naturally). HTC works with wet feedstock, and the process combines an acid catalyst and pressure at somewhat high temperatures (180 to 250°C) to produce hydro-char, this fossil fuel-like product that has high levels of carbon. Not only can hydro-char be used as fuel but it can also be used to replace coal. The product can also be used to enrich soil, while the feedstock can be used for gasification. The main advantage of HTC over other thermo chemical technologies like pyrolysis is that it doesn't require pre-treatment (pre-drying) of the feedstock, as it's designed to work with wet waste, which makes the process a lot faster.

• **Dendro Liquid Energy**

Dendro liquid energy (DLE) is probably the most promising and upcoming near-zero emissions waste-to-energy technology that treats waste biologically. DLE plants operate at moderate temperatures between 150°C and 250°C, which makes them about four times more efficient in generating electricity when compared to anaerobic digestion and other WtE solutions. Dendro liquid energy plants work with both wet and dry waste to generate clean fuels for electricity like hydrogen and carbon monoxide - basically, it produces syngas. DLE is cost-efficient because the process doesn't contain combustion, meaning it doesn't need expensive anti-emission technology to be environmentally safe. Some of the main advantages of DLE are that it has a high energy conversion of around 80% efficiency, and near-zero emissions, meaning the byproduct and syngas don't contain particulates. It is said to be four times more efficient than AD and costs less. It is also one of upcoming technologies.

**Regulations for control of food waste**

In India, some steps have been taken by the government, civil society organizations and private businesses to reduce wastage of food. The Food Safety and Standards Authority of India (FSSAI) has launched the save food, share food, share joy initiative for the distribution of food that could be potentially wasted. The U.S Food Waste Reduction Act will require food manufacturers and establishments to donate food surplus. Local food waste in U.S may soon dramatically decrease as the House of Representatives approved House Bill No. 8873, or the Food Waste Reduction Act. In Japan target 12.3 calls on all nations to halve food waste and reduce food loss by 2030. To reduce food waste, Japan previously enacted the 2001 Food Recycling Act (Act No. 116 of 2000, amended by Act No. 83 of 2007), which promotes reducing and recycling food wastes into fertilizer and feed. Japan also introduced the "Compulsory Food Waste Reduction Bill, 2018". The European Commission is taking the issue of tackling food waste very seriously. The EU and the EU countries are committed to meeting the Sustainable Development Goal 12.3 target to halve per capita food waste at the retail and consumer level by 2030, and reduce food losses along the food production and supply chains.

**Conclusion**

As the conversion of agricultural land for non-agricultural purpose is growing year on year which may pose the threat of reduction in the cultivatable land mean to say less production of food grain may cause a serious threat for food security. Reducing the food waste is the best alternative for food security and the proper utilization food waste to energy is an another alternative method to address the energy crisis in the industrial production sector. Europe is said to be the largest market for WtE technologies (47.6%), while Japan dominates 60% of Asia-Pacific WtE market for incineration. However, China has been growing their capacity since 2011. It is said that biological WtE will grow at an average rate of 9.7% as it becomes more commercially feasible. Despite all the advancements, WtE technologies have a long way to go in terms of being on par with conventional energy sources.



# Skin Glands and Their Roles in Animals



**Mayank Patel\*, R. Huozha, S. K. Rastogi, Aman Kamboj and Mrigakshi Yadav**

Department of Veterinary Physiology & Biochemistry, College of Veterinary and Animal Sciences, G. B. Pant University of Agriculture & Technology, Pantnagar, Uttarakhand

\*corresponding author:  
mayankpatel5015@gmail.com

## Abstract

Skin, the largest external organ of animal body plays significant physiological and protective roles in the body. The secretory products of skin include sweat and sebum. There are various modes of secretion from the skin glands. The secretory function of skin helps body to excrete the waste products and toxic metabolites, to regulate the body temperature and interaction among the animals through pheromones.

## Introduction

Skin is the largest external organ of our body, not only in surface area but even in bulk. The integumentary system consists of two major components; cutaneous membrane called skin and its accessory structures like hair, nails and skin glands. All skin glands consist of a secretory compartment, the gland or coil (tubulus), and an excretory part, the duct (ductus). Skin glands are exocrine kind of glands which release their biochemical products directly onto the skin surface. These skin glands are of epithelial origin, but their secretory compartments are located at different depths in the dermis. Role of integumentary system has multiple roles in homeostasis, including thermoregulation by activating or inhibiting sweat secretion, biochemical synthesis of vitamin D, protects body from injury, have sensory receptors for touch, pressure, temperature and pain. Besides these, skin glands have antibacterial and antifungal actions, excretion of waste products in the

form of sweat and body odours.

## Structure of the skin

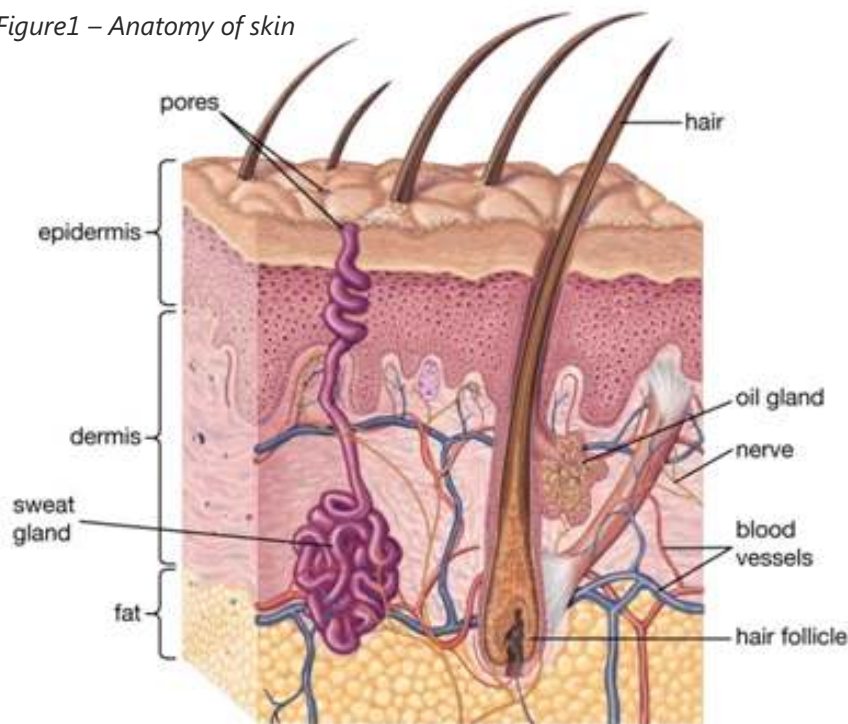
Skin consists of three layers. The epidermis is a vascular and outermost layer, consists keratinocyte cells synthesize keratin, melanocytes cells give protection from UV light, Langerhans cells serve immune function and Merkel cells serve as mechanoreceptors. While the thickness of epidermis varies from 50-150µm depending on the part of the body. Middle layer is the dermis or "true skin" which is thicker than the epidermis and composed of collagen fibres, fibroblast and histiocyte. It is structurally organized into the uppermost papillary and innermost reticular dermis. The sub-papillary plexus provides nutrients to the epidermis. Innermost layer is the hypodermis has loose connective tissue, which connects the skin with internal structures of the body. It serves as insulator to protect body from excessive heat and cold.

## Skin glands and their secretions

- **Based on their products:** Sebaceous and sweat glands secreting sebum and sweat.
- **Based on their secretory function or mode of secretion:** Holocrine glands which include sebaceous glands, apocrine sweat glands that release both the cytoplasmic contents and cell membranes into their ducts. Another is merocrine glands i.e.; eccrine sweat glands excrete their products via exocytosis from secretory cells.



Figure1 – Anatomy of skin



- **Based on their location of products secreted:** The ducts of sebaceous glands is in the innermost, apocrine sweat glands excrete their products into the hair follicle canal, and eccrine sweat glands excrete their products directly onto the skin surface.

### Sebaceous gland

Sebaceous glands are located throughout the skin, at the side of the hair follicle and are ovoid or spherical in shape. It is absent in the thick skin present at the sole of feet. Sebaceous glands open into the neck of the hair follicle through a duct except in face, lips, glans penis and labia minora glands it open directly into the exterior. Sebaceous glands are oil (sebum) secreting glands and require eight days for its production. Sebum consists of Glycerides (30-50%), Fatty acids (15-30%), Waxes (26-30%), Squalene (12-20%) and Cholesterol (1.5-2.5%). Increased sex hormones activate sebaceous gland at the time of puberty particularly dehydroepiandrosterone due to

which development of acne (localized inflammatory condition) observed. Sebum content of various free fatty acid acts as antibacterial and antifungal actions against skin bacterial and fungal infections.

### Sweat glands (sudoriferous glands)

Sweat glands are of two types as eccrine and apocrine glands. Eccrine sweat glands are a tubular coiled gland and the most numerous glands distributed across nearly the entire body surface area. It is responsible for the highest volume of waste products excretion as sweat (clear and watery odourless substance). Sweat consists of mostly water, NaCl, urea and lactic acid. It also plays an important role in body temperature regulation.

Apocrine glands are limited to specific areas of the body like umbilicus. The coiled portion of apocrine glands lies into deep dermis but the duct opens into the hair follicle above the opening of sebaceous gland. Apocrine sweat

glands are non-functional till puberty and develop due to the influence of gonadal hormones. Once developed, they start functioning independently. The function of these glands gradually declines with aging. Apocrine glands unlike the eccrine glands, secrete thick and milky sweat with much lesser in production. The secretion contains water, protein, carbohydrate waste material and NaCl. It serves virtually no role in body temperature regulation, but is largely responsible for body odours as their excretions are converted by skin bacteria into various chemicals. In horse, cattle apocrine glands help in heat loss but have a limited role in dog, cat, goat and pig.

There is variability in regional and whole-body sweating rate within and between individuals due to differences in sweat secretion rate per gland rather than the total number of active sweat glands.

### Skin glands performing various role

- **Excretion of waste products:-** Skin glands help removal of body waste products by secreting them as sweat and sebum. Sweating eliminates excess water, salts and small amount of urea which are continuously produced in the body.
- **Secretion of sexual pheromones:-** Pheromones are a group of chemical substances secreted by scent gland of sweat gland. Pheromones cause some behavioural or physiological changes in other members of the same species. Scent glands are not confined to urogenital skin but in other areas as well. Elephants have musth glands behind their eyes, male deer in abdomen region and goat

scent glands is modified sebaceous glands located around caudomedial aspect of horn base. Pheromones plays vital role in sexual attraction, mother-young interactions, estrus indication, puberty acceleration, reduces postpartum anestrus, hormonal stimulation and enhance smale mating behaviour. Bulls exhibits a specific behaviour called flehmen reaction whenever exposed to estrus cow discharges which is used to detect estrus cow. The sex attractant volatile compounds excreted in the discharges of the estrus female are capable of enhancing successful mating and sperm quantity in male.

- **Thermoregulation of body:-** Sweat glands play important role in body temperature regulation. The number of sweat glands is not same in all the species. Buffalo has 394/cm<sup>2</sup> sweat glands in their skin which cause more prone to heat stroke. While in cattle the number of sweat glands varies from 600/cm<sup>2</sup> in Shorthorn cattle to 1600/cm<sup>2</sup> in zebu cattle. It is observed that the greater number of sweat glands in zebu cattle is linked with their ability to regulate their body temperature and more heat tolerant than other breeds of cattle. Sweating rates ranged between 189 ± 84.6 and 522 ± 127.7 g/m<sup>2</sup>-h in cattle when body temperature ranged between 39.3±0.53°C and 41.7 ±0.19°C respectively.

Eccrine sweat glands play important role in thermoregulation as compare to apocrine sweat glands. Eccrine sweat glands primarily respond

to thermal stimuli; particularly increased body core temperature, skin temperature and associated increases in skin blood flow. An increase in body temperature is sensed by central and skin thermoreceptors and this information is processed by the preoptic area of the hypothalamus to trigger the sudomotor response. Recent studies suggested that thermoreceptors in the abdominal region and muscles were found active in the control of sweating. Thermal sweating is mediated predominately by sympathetic cholinergic stimulation. Sweat production is stimulated through the release of acetylcholine from non-myelinated class C sympathetic postganglionic fibre's, which binds to muscarinic (subtype 3) receptors on the sweat gland. Eccrine glands also secrete sweat in response to adrenergic stimulation, but to a much lesser extent than that of cholinergic stimulation. Catecholamines, as well as other neuromodulators, such as vasoactive intestinal peptide, calcitonin gene-related peptide, and nitric oxide, have also been found to play minor roles in the neural stimulation of eccrine gland sweating. In addition, eccrine sweat glands respond to non-thermal stimuli related to exercise and are thought to be mediated by feed-forward mechanisms related to central command, the exercise presser reflex, osmoreceptors, and possibly baroreceptors.

Sweating rate over the whole body is a product of the density of active sweat glands and the secretion rate per gland. Upon stimulation of sweating, the initial response is a rapid increase in sweat gland recruitment, followed by a more gradual increase in sweat secretion per

gland. After the Secretion, evaporation of sweat at the surface of the body results into loss of heat.

During winter body try to gain heat maximum and lost heat minimum. Sebaceous glands play major role during cold environment. Lipids of the sebum prevent heat loss from the body by trapping heat and also protect the skin from unnecessary desquamation and injury caused by dryness.

- **Milk secretion:-** Milk is secreted by mammary glands. Milk provides passive immunity. Mammary glands are the modified apocrine sweat gland and located in udder. Mammary glands consist of secreting part (alveolus) and duct system. Histologically, in the more advanced mammals it is a compound of tubulo-alveolar type that originates from the ectoderm. The Growth of mammary duct system and alveolar system due to influence of estrogen and progesterone hormones respectively.

## Conclusion

Skin glands are exocrine glands, consisting of sudoriferous (sweat) glands and sebaceous glands which form part of the integumentary system. Sweat glands as eccrine sweat glands and apocrine sweat glands, and sebaceous glands produce sebum in maintaining body homeostasis, thermoregulations and keeping the body healthy by preventing accumulation of waste products. Mammary glands, scent glands, ceruminous glands are modified sweat glands present in body performing unique functions.



Event by:



# THE Dairy EXPO

Exhibiting The Future of Dairy Industry

## AUGUST 2023

India Expo Center & Mart,  
Greater Noida, Delhi-NCR, India

For Any Query:

**Pixie Expo Media Pvt Ltd.**

C/O Omang Hotel, Namaste Chowk,  
Karnal-132001, Haryana

✉ info@thedairyexpo.in

☎ 741999 3009 | 999 170 5007

Media Partner



Supported by



[www.thedairyexpo.in](http://www.thedairyexpo.in)



# Baani Milk Producer Company Limited

An Integrated Milk Producer Company



**Baani Milk Producer Company** is Punjab's integrated milk producer company which was incorporated & operationalized in year 2014.

It is fully owned by Punjab's dairy farmers, who work hard to ensure that customers get quality milk products.

Baani is currently operating in 1145 villages covering 9 districts of Punjab state of India & having more than 61,000 dairy farmer members out of which 40% are women.

Baani Milk Producer Company is committed to increase income of its members by increasing milk production, reducing milk production cost and by offering competitive price and necessary services.

During year 2021-22, company has ensured that more than 85% of the total revenue goes back to the farmers.

Transparency at all levels of operation is the major achievement of Baani Milk Producer Company Limited. Along with this automation at village level, direct amount transfer of milk payments to member's bank account, input

services (Cattle Feed, Area Specific Mineral Mixture, Subclinical Mastitis Screening, Farm Development Project, Dairy Trainings etc.), quality dairy products and management by professionals with vast experience are the major factors which has made Baani a successful company.

Baani has embarked on an ambitious digital journey by enabling all the stakeholders to connect digitally with company's IT systems.

At core, Company has deployed world class SAP ECC ERP system covering all the operations thus enabling real time, secure, automated and transparent information processing.

Further to achieve its mission of digitalization, company has deployed many other applications to digitally engage with all the stakeholders to achieve high levels of timely, effective, automated and transparent service delivery.

This helped the company to conform to its values viz. timeliness, transparency and honesty.







**Member Mobile Application**

Company has deployed HRMS for human resources management, Distributor & Sales Force Automation solution, a smartphone application for members, a smartphone based milk collection application to collect milk from members at Milk Pooling Points, Fixed Assets Management software to manage more than 25000+ barcoded assets at all the locations with a smartphone application to audit the assets, digital integration with banks for automated and encrypted transfer of payments to vendors, an application for paperless on boarding of new members, a accountable and responsive Grievances Redress mechanism, a toll free number with IVR facility.

Along with this with help of automatic logistic utility company has optimized logistic cost & capacity utilization.

All the vehicles for transfer of raw milk and finished products are GPS enabled for better monitoring.

All the critical operational locations like MCCs and Plants are under CCTV surveillance. Field team activities are monitored through smartphone based application for better coordination.



**Productivity Enhancement Services**

**Milestones Achieved**

- Appreciation Certificate for Maximum Digital Payment in the state by NDDB: Baani Milk Producer Company Limited has been provided appreciation certificate for facilitating Maximum Digital Milk Bill Payment in the state by NDDB in 2020-21.
- Baani Milk Producer Company has been recognized as one of the "FT HIGH-

Growth Companies of Asia-Pacific 2020" by The Financial Times and Statista.

- Baani Milk Producer Company was awarded Excellence Award for Industrial Development for the outstanding contribution to National Development by Indian Economic Development & Research Association (IEDRA) in the field of Dairy Industry in 2018-19.



**Transparent Milk Procurement System**







## Women Empowerment- Gyandhara's CSR Initiative

### Gyandhara Mitra

Gyandhara is contributing to support rural women by providing them employment and consequently being able to sustain their livelihood. We target the women having no asset base or alternative source of income. We channel this through a simple process in which we select the eligible partners who match the criteria. The flow then goes along and is monitored regularly which reaps great results and rewards for the women who are associated with us.

### Gyandhara Manthan

With the value of keeping Farmer's first, Gyandhara Manthan & Veterinary Camp is a unique initiative that serves our commitment to the growth and development of dairy farmers. The training session is being organized by professional veterinarians and trained professionals to educate farmers about animal health, feed management and nutrition.

### Veterinary Camps

With the mission of improving livestock health, we are organizing veterinary camps to provide free de-worming and free health check-ups of dairy farmer's livestock.











## In Ahmedabad, Parag Milk Foods Introduces the "Pride of Cows" Brand

Pride of Cows, a premium milk brand from Parag Milk Foods, has introduced in Ahmedabad. Parag Milk Foods is a leading dairy FMCG company that owns well-known brands such as Gowardhan, Go, and Avvatar.

"Pride of Cows would provide quality fresh cow milk from our Bhagyalakshmi Dairy Farm to consumers in Gujarat's largest city every day, along with additional single-origin milk products like curd, ghee, fat-free milk, and paneer." After all, being single-origin has its advantages," the company stated.

Devendra Shah, Chairman of Parag Milk Foods, said of the launch, "We are excited to introduce Pride of Cow to the vibrant Ahmedabad market." The dairy industry is rapidly expanding, and the functional advantages of single-origin milk products have demonstrated excellent benefits and

garnered significant appeal. For more than a decade, Parag Milk Foods has been a pioneer in the single-origin milk segment, and we hope to replicate our success in Mumbai, Surat, Delhi, Pune, and Ahmedabad. We are confident in the launch's success based on our experience and customer preferences. We intend to bring new vitality, diversity, and nutrition, as well as flavour and purity, to the rapidly growing premium dairy industry at an advantageous time."

"We Indians believe in the goodness and purity of milk, but unfortunately milk adulteration is still a common phenomenon," said Akshali Shah, Sr. VP- Strategy, Sales & Marketing, Parag Milk Foods, speaking about the new launch. We can provide unadulterated, nutritious dairy products with Pride of Cows - single-origin milk and milk products. It uses a

novel farm-to-home model to deliver fresh and pure cow milk from India's most modern dairy farm with a select breed of cows. Produced without human intervention and in accordance with European standards, it provides milk that is free of adulteration and ensures complete hygiene. We maintain the highest quality and food safety standards while providing a superior experience by not using any additives or preservatives."

The product will be priced at Rs. 99 per litre, and the Pride of Cows milk will be available only through online order placements under the existing subscription-based model. In order to share its passion for quality milk and dairy products, the brand plans to launch a number of campaigns through fitness enthusiasts and health influencers.





Guru Angad Dev Veterinary and Animal Sciences University  
ਗੁਰੂ ਅੰਗਦ ਦੇਵ ਵੈਟਨਰੀ ਐਂਡ ਐਨੀਮਲ ਸਾਇੰਸਜ਼ ਯੂਨੀਵਰਸਿਟੀ

## GADVASU Introduces 'YODHA,' A Livestock Farmers' Mobile App

Guru Angad Dev Veterinary and Animal Sciences University (GADVASU) has introduced a mobile application called YODHA app in response to the issues faced by livestock farmers. The application will address the problems that livestock farmers are dealing with, including the African Swine Fever and lumpy skin disease that have been worrying them recently.

The College of Animal Biotechnology, GADVASU, has

created the Android-based mobile application "Your Own Dairy Herd-data Analyser," also known as YODHA (version 1.1), to allow dairy farmers to record real-time data on pedigree, production, reproduction, disease occurrence, vaccination, purchase and sale of produce and farm-related items (like feed/fodder, medicines, etc.), and provide easily understandable output formats in the form of tables and graphs.

At the field level and even in organised herds of cattle, vice chancellor Dr. Inderjeet Singh said that gathering data and ensuring the accuracy of data recordings had always been difficult tasks. He suggested that the best way to address this long-standing issue would be through a mobile application powered by artificial intelligence. The YODHA app aims to automate the country's dairy farmers' herds' phenotype recording.

## Amit Shah promises that the government will increase the domestic dairy market to Rs 30 billion.



Amit Shah, Union Home and Cooperation Minister, said on Friday that the government is committed to increasing the domestic dairy market from Rs 13 lakh crore to Rs 30 lakh crore by 2027, and that India has a huge opportunity to supply milk to countries such as Bhutan, Nepal, Bangladesh, and Sri Lanka.

The Union Minister stated at the Eastern and North-Eastern Cooperative Dairy Conclave 2022 that the government is establishing a multi-state cooperative that will act as an export house to explore this market.

He stated that the government has implemented numerous animal husbandry programmes over the last seven years, and that the budget of Rs 2,000 crore has been increased to Rs 6,000 crore.

Shah stated that the Ministry of Cooperation and the National Dairy Development Board (NDDB) intend to establish a Multipurpose PACS (Primary Agricultural Credit Society) in each Panchayat over the next five years, which would include arrangements for LPG distribution, petrol pump and storage, and marketing in addition to dairy distribution.

He stated that the eastern and northeastern regions of the country will benefit the most from this because they have the fewest PACS registered.

The Union Minister urged all non-governmental organisations (NGOs) working in the field of women's empowerment to focus on the dairy industry because it is the best example of women's empowerment. Dairy gas benefits the environment, cow dung benefits natural farming, and natural farming benefits human health.

## Arla Food develops an eco-rewards programme for dairy farmers.



**Arla Foods has announced that if farmers meet new environmental sustainability targets, they will be paid more for their milk.**

Arla Foods has unveiled a comprehensive new incentive programme to assist farmers in meeting the company's 2030 emissions reduction targets.

The milk price each individual Arla farmer will receive from the dairy co-op "will depend on his or her activities related to environmental sustainability" beginning next year, according to the company.

The programme will begin next year and will build on Arla's Climate Check programme, which has seen 8,000 farms across seven European countries provide detailed climate data that allows the co-op to track supply chain emissions. The goal is to ensure that the company meets its goal of reducing Scope 3 supply chain emissions by 30% per tonne of standardised raw milk and whey by 2030 compared to 2015.

**Developing a more environmentally friendly supply chain**

The move is part of Arla's efforts to meet its Scope 3 goal of reducing emissions by

30% per tonne of standardised raw milk and whey by 2030. (against a 2015 base year).

The supplier's new point-based Sustainability Incentive model is built around 19 different 'levers' that cover everything from manure delivery to biogas to biodiversity enhancements, feed and fertiliser efficiency, renewable electricity usage, and deforestation-free soy feed sourcing.

"The Sustainability Incentive will be a powerful tool for driving additional improvements." Arla has some of the world's most climate-efficient farmers, but they also recognise that they must step up their efforts to be at the forefront of environmentally sustainable dairy. With this historic step, we will strengthen our market position and send a clear message to our customers and consumers that the necessary change comes at a cost to our owners, and that a fair portion of the money you pay for Arla products is directed to the farmers who take the most action," says Peder Tuborgh, CEO of Arla Foods.

## Milk federation invites tenders to build a new Aavin dairy in Madhavaram at a cost of Rs.125 crore.



The new dairy, with a capacity of 10 lakh litres of milk per day, will be the fifth facility to meet Chennai's demand.

Tenders have been issued for the construction of a new dairy for Aavin in Madhavaram at a cost of Rs.125 crore. The facility, the city's fifth, will have a capacity of 10 lakh litres of milk per day (LLPD).

According to a representative of the Tamil Nadu Cooperative Milk Producers Federation, which owns the Aavin brand, the city currently consumes approximately 15 LLPD of milk processed at its dairies in Madhavaram, Ambattur, Sholinganallur, and Kakalur. "We have been working to increase processing capacity in order to increase sales and benefit both farmers and consumers." The Federation can process 40 LLPD of milk, and the new addition will increase capacity by 10 LLPD, according to an official.

Aavin hopes to open the dairy by the end of 2023, which will be built on 200 acres of land in Madhavaram. "We have placed tenders for both the building, which is being built at a cost of 25 crore, and the machinery, which is being purchased at a cost of 70 crore." The dairy unit, which would process all four milk variants, would be fully automated, complete with pasteuriser, homogeniser, and chiller. "We are looking into having boilers that can run on multiple fuels to reduce operating costs," the official added.

The existing Madhavaram dairy supplies 4.5 LLPD, the Ambattur dairy supplies 4.2 LLPD, Sholinganallur 5.5 LLPD, Kakalur 30,000 litres per day, Villupuram 30,000 litres per day, and Vellore 20,000 litres per day of the 15 LLPD of milk sold in Chennai. The Federation purchases approximately 40 LLPD of milk from farmers who are members of cooperative societies throughout the state.

Another official stated that the milk market was ready to be tapped. "As the city grows, there are more areas where consumers are willing to buy Aavin milk because of its quality and low price." "Once processing capacity is increased, more farmers will join the cooperative," he predicts.

## ENOUGH Opens World's Largest Non-animal Protein Facility in the Netherlands

**UK-based food tech company innovates towards the sustainable food transition**



ENOUGH (formerly 3F BIO), a UK-based food technology company, has opened its flagship protein facility in the Netherlands. The new factory is the world's largest non-animal protein farm, allowing ENOUGH to contribute to the transition to sustainable food systems.

The 15,000 square metre (160,000 square feet) facility is co-located alongside the Cargill facility in Sas van Gent and has an initial capacity of 10,000 tonnes (22 million pounds) per year from Q4 2022. The location and collaboration with Cargill ensure the most efficient feed source and supports ENOUGH's zero-waste goal.

### Supporting a circular economy

ENOUGH intends to reach a capacity of 60,000 tonnes by 2027, which is equivalent to producing one cow's worth of protein every two minutes. This is completely consistent with the development of the circular economy, and the new facility has been supported by the circular Bio Based Europe Joint Undertaking CBE JU, which has received €16.9 million in EU funding as part of project Plenitude1, which includes partners from the entire value chain.

### Collaborating with the Dutch on the future of food

ENOUGH's vision is fully aligned with consumer's desires to shift towards a more sustainable diet. As part of the Dutch agrifood ecosystem, ENOUGH's new plant also supports the Dutch government's National Protein Strategy for the future of food and its initiatives to cultivate alternative protein sources, including microbial proteins and cultured meat.

ENOUGH also contributes to green job creation in the region as it currently employs 30 people directly and many more in the supply chain, with significant expansion plans.

## Merck Animal Health to Acquire Vence



**Virtual fencing system provides advanced technology to cattle producers and ranchers to manage natural resources more effectively**

**Complements Merck Animal Health's broad portfolio of veterinary pharmaceuticals, vaccines and animal intelligence solutions**

Sept. 22, 2022 – Merck Animal Health, a division of Merck & Co., Inc., Rahway, N.J., USA (NYSE:MRK), has announced the signing of a definitive agreement under which Merck Animal Health will acquire Vence from its founders and shareholders. Vence is a virtual fencing pioneer for rotational grazing and livestock management. Subject to customary closing conditions, the acquisition is expected to close in the third quarter of 2022. The agreement's specific terms were not disclosed.

Vence, a privately held company, provides enhanced technology for producers and ranchers to track, monitor, and manage cattle movement via a high-tech platform of virtual fencing solutions. Customers can manage cattle movement and rotational grazing using a computer or smartphone. Vence's virtual fencing technology can reduce the need for fencing to subdivide pastures and allow producers and ranchers to manage their cattle and grass inventory while saving money on labour and fencing materials.

"The acquisition of Vence will broaden our portfolio with complementary products and technologies to advance animal health and well-being as well as customer outcomes," Rick DeLuca, president of Merck Animal Health, said. "Vence is a natural fit with Merck Animal Health's expanding portfolio of animal intelligence products, which includes products for identification, traceability,



and monitoring." This new technology will allow cow-calf producers to track their cattle and move them from pasture to pasture."

Vence technology is currently available in the United States and parts of Australia.

## Sid's Farm wins Telangana's 'Best Agri Startup' award.



Sid's Farm, a premium D2C dairy brand based in Telangana, was recognised and honoured as Telangana's 'Best Agri Start-up.' This award was given to the company at a well-attended awards ceremony hosted by The National Institute of Agricultural Extension Management (MANAGE) in collaboration with Samunnati, India's largest open-agri network of smallholder farmers. Dr. Kishore Indukuri, Founder of Sid's Farm, accepted the award on behalf of his organisation from Sushri Shobha Karandlaje, Minister of State for Agriculture and Farmer Welfare, Government of India.

The MANAGE - Samunnati award recognises start-ups that are committed to rebuilding the agriculture development ecosystem and assisting farmers through technological innovations.

"At Sid's Farm, we have focused on quality and customer-focused operations that we are constantly improving and bettering." We are grateful to our farmer partners, as well as all of our hardworking team members, whose innovative thinking and willingness to serve have helped us become a people's organisation. This honour, for which I am grateful, renews our commitment to creating a healthy, safe, and ethically nourished India." Dr. Kishore Indukuri, Founder of Sid's Farm, stated.

## Purabi Dairy receives the NCDFI award for being the second best performing dairy cooperative.

Ltd (NCDFI) organised the conclave in collaboration with Sikkim Cooperative Milk Producers Union Ltd and with the support of the Sikkim government.

Later, he inaugurated phase I and kicked off phase II of the Manure Management Project, which was co-funded by NDDB and Sustain Plus Energy Foundation and implemented by Sikkim Milk Union.

The event was attended by the chief



Amit Shah, Union Minister for Home and Cooperation, presented the National Cooperative Dairy Federation of India Ltd (NCDFI) award to Purabi Dairy, Assam's largest dairy cooperative, as the second best-performing dairy cooperative in institutional sales, on October 7 at the Eastern and North-Eastern Cooperative Dairy Conclave 2022 in Gangtok, Sikkim. The National Cooperative Dairy Federation of India

minister of Sikkim, Prem Singh Tamang (Golay); the education minister of Sikkim, Kunga Nima Lepcha; the Speaker of the Sikkim Legislative Assembly, Arun Kumar Upreti; the ministers of Animal Husbandry & Veterinary Services, Agriculture, Horticulture, and Labour of the government of Sikkim, Lok Nath Sharma; and the minister of Cooperation, Rural Development, and Ecclesiastical departments

## November 2022

### 1. EuroTier

**Dates:** November 15 - 18, 2022

**Venue:** Deutsche Messe AG

**City:** Hannover

**Country:** Germany

**Website:** www.eurotier.com

### 2. ILDEX Indonesia 2022

**Dates:** November 9 - 11, 2022

**Venue:** Indonesia convention exhibition

**City:** Jakarta

**Country:** Indonesia

**Website:** www.ildex-indonesia.com

## December 2022

### 1. Agri Livestock 2022

**Dates:** December 2 - 4, 2022

**Venue:** Myanmar Expo Hall

**City:** Yangon

**Country:** Myanmar

**Website:** www.agrilivestock.net

## January 2023

### 1. Dairy Forum 2023 (IDFA)

**Dates:** January 22 - 25, 2023

**City:** Orlando

**Country:** Florida

**Website:** www.idfa.org/events

### 2. DairyTech

**Dates:** January 25 - 27, 2023

**Venue:** Crocus Expo International

**City:** Moscow

**Country:** Russia

**Website:** www.dairytech-expo.ru

### 3. IDEX 2023

**Dates:** January 28 - 29, 2023

**Venue:** Expo Center

**City:** Lahore

**Country:** Pakistan

**Website:** www.internationaldairyexpo.com

## February 2023

### 1. Agroexpo

**Dates:** February 1 - 5, 2023

**City:** Izmir

**Country:** Turkey

**Website:** en.agroexpo.com.tr

### 2. Dairy and Poultry Expo

**Dates:** February 2 - 4, 2023

**Venue:** International Convention

City Bashundhara

**City:** Dhaka

**Country:** Bangladesh

**Website:** www.limraexpo.com

### 3. GulFood

**Dates:** February 20 - 24, 2023

**Venue:** Dubai World Trade Centre

**Country:** Dubai

**Website:** www.gulfood.com

## August 2023

### 1. The Dairy Expo

**@ The Livestock Expo**

**Dates:** August, 2023

**Venue:** India Expo Center & Mart

**City:** Greater Noida - Delhi

**Country:** India

**Email:** info@thedairyexpo.in

**Website:** www.thedairyexpo.in

## October 2023

### 1. World Dairy Expo

**Dates:** October 1 - 6, 2023

**Venue:** Madison

**City:** Wisconsin

**Country:** USA

**Website:** www.worlddairyexpo.com

# Editorial Calendar 2022

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

## Subscription Rates

### Time Period

<b>1 Year</b>	<b>INR 2400</b>	<b>USD 250</b>
<b>3 Year</b>	<b>INR 6500</b>	<b>USD 650</b>
<b>5 Year</b>	<b>INR 10000</b>	<b>USD 1000</b>

\*18% GST Extra

Contact Name : \_\_\_\_\_

Company Name : \_\_\_\_\_

Postal Address : \_\_\_\_\_

City : \_\_\_\_\_ State : \_\_\_\_\_ Mob. No. \_\_\_\_\_

Postal Code : \_\_\_\_\_ Country : \_\_\_\_\_

### We wish to subscribe the following

#### Poultry Planner

1 Year  3 Year  5 Year  
from \_\_\_\_\_ to \_\_\_\_\_

#### Dairy Planner

1 Year  3 Year  5 Year  
from \_\_\_\_\_ to \_\_\_\_\_

#### Poultry Times of India

1 Year  3 Year  5 Year  
from \_\_\_\_\_ to \_\_\_\_\_

Grand Total: \_\_\_\_\_

### Payment Details:

Send DD or Cheque in favour of Pixie Consulting solutions Ltd. payable at Karnal  
 Address: C/o OmAng Hotel, Namaste Chowk, Near Janta Petrol Pump,  
 KARNAL - 132001 (Haryana) INDIA or Transfer money to HDFC Bank  
 Bank address: Opp. Mahavir Dal Hospital  
 Account Type: Current  
 Account Name: Pixie Consulting Solutions Limited  
 Account Number: 01958730000179  
 IFSC Code: HDFC0000195 | Swift Code: HDFCINBB | PAN No. AAACP6186B

For more detail, contact:



**Pixie Consulting Solutions Ltd.**  
 C/o OmAng Hotel, Namaste Chowk, Near Janta Petrol Pump,  
 KARNAL - 132001 (Haryana) INDIA  
 Email : poultry.pcsl@gmail.com | editor.pcsl@gmail.com  
 Website : www.pixie.co.in  
 M: +91 999 170 5007 | 7419993009

Date: \_\_\_\_\_ Company's Stamp & Signature

By signing this form I acknowledge that I have read and agree to the quoted cost above

\*5% GST Extra **Advertisement Tariffs**

Advertisement Type	Single Issue (cost @)	Advertisement Type	Single Issue (cost @)
Front Page	45000 <input type="checkbox"/>	Back Title	30000 <input type="checkbox"/>
Front Gate Fold	45000 <input type="checkbox"/>	Back Gate Fold	30000 <input type="checkbox"/>
Front Title Inside	30000 <input type="checkbox"/>	Back Title Inside	25000 <input type="checkbox"/>
Front Title Opening	25000 <input type="checkbox"/>	Back Title Opening	20000 <input type="checkbox"/>
Full Page	12000 <input type="checkbox"/>	Center Spread	35000 <input type="checkbox"/>





# LUMPY SKIN DISEASE (LSD)

A CRITICAL PROBLEM IN DAIRY ANIMALS



High Fever



Nodules



Low Appetite



Reduced Milk Production



## Always Trust Experts



### तीन का वार, लम्पी की हार



**CHARMIL Plus**  
MULTI-ACTION SKIN GEL

- Helps in faster wound healing
- Having antibacterial as well as Anti-viral properties
- Fly repellent action to ensure no spreading



**RESTOBAL**  
HERBAL BILIRUBINOCHELATOR, ANTISTRESSOR AND RELAXANT

- Enhances the immune system
- Helps in faster recovery
- Provides relief in stress



**RUCHAMAX**  
APPETITE STIMULANT AND DIGESTIVE TONIC

- Increases Appetite
- Maintains Rumen microflora
- Improves Milk Production after treatment



# ONE TASTE MANY SMILES



Baani is committed to increase the income of its dairy farmer members by increasing milk production and reducing milk production cost



## BAANI MILK PRODUCER COMPANY LIMITED



BAANIMILK

Regd. Office :

SCO 37-38, First Floor, Urban Estate, Phase II,  
Rajpura Road, Patiala - 147002 (PB)

☎ 0175-5000735 | ✉ info@baanimilk.com

🌐 www.baanimilk.com



BAANI.MILK