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Management of Infected Wound

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1. INTRODUCTION

It is defined as disruption or discontinuity in the skin, tissue or mucous membrane caused by physical, chemical or biological agent.

Wounds are surgical entity and require thorough attention. The treatment of the simple wound responds well however in septic wounds, it is problematic or complicatory. If the treatment is not started in time it may terminate to septicemia or toxemia resulting to the fatal consequence or serious complication. The simple or suspicious wound may convert to septic wound therefore proper attention is needed well in time for the treatment of septic wound.

(A) Classification

(i) Open wound

(ii) Closed wound

(B) Clinical classification

(i) Clean - (Class 1) Clean lacerated wound of 0 to 6 hr duration with minimal contamination.

(i) Contaminated (Class 2) 6 to 12 hrs duration with significant contamination.

(ii) Dirty (Class 3) 12 hrs. or longer duration with gross contamination.

Septic wound

Also called infected / suppurative / contaminated / dirty. "An infected wound is one in which micro-organism have invaded the tissues and have started multiplying and producing toxins".

"A fresh wound get contaminated when it is more than 4 or 5 hrs. old".

2. ETIOLOGY

Any wound may convert into septic wound with invasion of pathogenic microorganism.

3. SYMPTOM OF WOUNDS

Local symptoms

- Haemorrhage.
- Pain.
- Gaping of the lips of the wound.

Systemic symptoms

- Febrile disturbance.
- Signs of toxemia.
- Swelling or abscess formation may occur in dependent lymph gland.
- Neuritis extending along the course of a nerve involved in the wound.

4. DIAGNOSIS

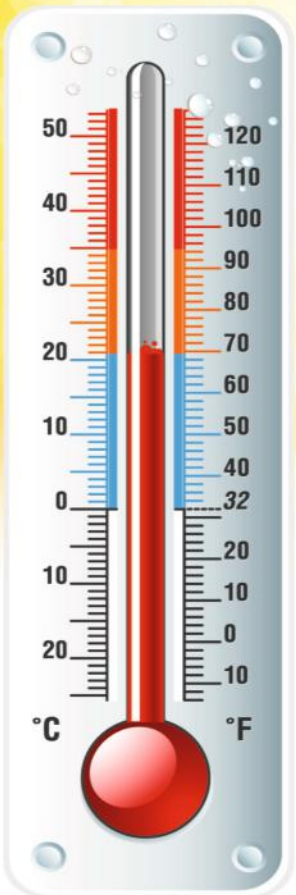
History provided by the owner regarding the wound is of importance; as it will provide information in regard to manage mental aspect of the wound. The sources of wound contamination eg stool, urine and barbed wire should also be kept in mind. The secondary bacterial infection by microorganisms especially in case of horses as Clostridium tetani causing tetanus must be kept under consideration, as further complication will take place and wound healing will be delayed. eg:- Dog bite, Accidental.

A. Visual examination: - Presence of dust, dirt, pus and foreign bodies.

B. Clinical examination - Recording of the temperature, pulse rate, respiration rate, and appetite.

- **Nature of exudates:-** Color, odour.
- **Nature of pus :-**
- Thin watery pus with offensive odour than the infection can be suspected for Bacillus coli.
- Greenish color pus than the infection can be suspected for B.pyocyaneus.
- Abscess formed, production of frank pus, thick & creamy color than the infection can be suspected for Staphylococcus.
- No abscess formation, watery, thin & scanty discharge than the infection by can be suspected for Streptococcus.
- **Lesion on the muscle tissue -** ischemia, necrosis & gangrene.
- **Surface & Margin of wound (raised or depressed) -** Surface is variegated with grayish & blackish spot if wound is recent.
- **Depth of wound** or its link with fistulous tract, if any, as in case of maggoted wound.
- **Biopsy:** Bacterial culture and antibiotics sensitivity test.

Temperature is rising...



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The level and impact of heat stress on cows is influenced by a combination of ambient temperature and relative humidity. New research has shown that temperatures in excess of 20°C and 50% relative humidity[2] will lead to cow discomfort and reduced milk production.

1 Saint Pierre et al., 2003 - 2 Burgos & Collier, 2011.

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**Marfola, et al, ADSA 2010.*

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5. GENERAL MANAGEMENT OF SEPTIC WOUND

(a) Cleaning of wound

The hair around the wound are clipped, taking care to see that cut pieces of hair do not enter the wound. The wound and surrounding areas are irrigated with mild, non-irritant antiseptic eg: solution removing dead tissue.

eg:- Solution is used perchloride of Hg (1 in 1000) acriflavin solution (1 in 500).

Wound is washed with warm normal saline and soap or 2% H2O2. 5% Dettol or Savlon.

(b) Debridement and trimming of wound

- Most important mode of wound therapy to prevent dead and damage tissue which serves as a bacterial media.

(i) Scalpel should be used to remove shredded muscle, torn fascia, black discoloration of skin.

(ii) Dead debris is removed by probe.

(iii) Artery, vein, nerve, tendon and ligament should not be injured.

Medicament: - 2.5% sod. Chloride solution, povidone iodine.

(c) Control of infection

After irrigating the wound it is covered with a moist antiseptic pad or an antiseptic powder or ointment.

eg:- Antiseptic powder as boric acid Sulphanilamide, Iodoform.

Ointment - Streptomycin, terramycin.

(d) Closure of wound

Wound with extensive destruction like in gunshot motion, bite case of extensive spoilage by intestinal content or external source if clinician is not still convince about treatment then removal of contamination for few day.

(e) Drainage of wound

- A drainage should be provided to evaluate pus, exudate serum etc.
- In case of deep wound fenestrated rubber tube is kept in the wound to provide dramage. The drain is generally removed after 4-5 days or after cerration of exudate.

(f) Dressing of the wound

- Depending upon the nature the wound should be dressed with antiseptic / antibiotics ointment or chemical debridiment agent.
- Dressing done by covering with gauze and bandage over the wound.
- Dressing should be daily for 5-7 days.
- Provide counter opening to facilitate drainage of pus.

(h) Suture material used in septic wound

- If suturing is unavoidable and there are chances of produce suture sinus formation then preference for synthetic absorbable sutures material should be given eg. Catgut, Polyglactin (vicryl), Poly glycolic acid (Relyon).
- The occurrence of sinus is greater with non absorbable material than catgut.
- Braided non absorable suture material others than steel should not be used because there are risk of sinus air abscess formation.

6. SPECIFIC MANAGEMENT OF WOUND

- **In case of horse:** A prophylactic dose of antitetanus serum (1500 to 3000 unit) is always recommended because of their great susceptibility to tetanus and also antitetanus globulin is used.
- **In case of maggot infestation:** The wound should be initially dressed or irrigated with phenyl solution or a combination of oil to kill the maggots and use of Ivermectin, Turpentine, Lorexane, Topicure, Skin heal, D-mag.
- In case of dog bite: These wound are deep, caused by penetration by teeth of dog. They are of special concern because various pathogenic organisms found in the mouth of animal are carried deep into the wound; there is chance of contracting rabies if bitten by an infected dog. The wound should be washed with plenty of soap and water and use antirabies vaccine.

7. SUPPORTIVE THERAPY

1. Fluid therapy:- Dextrose and saline injection, normal saline solution containing 5-10% glucose may be used to treat shock and haemorrhage.
2. Injection of antitoxic serum.
3. Provide good hygiene and management.
4. Blood transfusion.
5. Thermotherapy.
6. Vit-C - is necessary for the formation of intercellular substance and maturation of pre-collagen of connective tissue. Vit-K is concerned with coagulation of blood.

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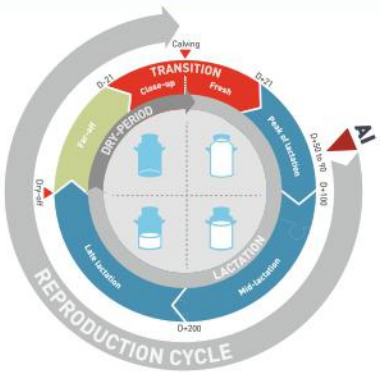

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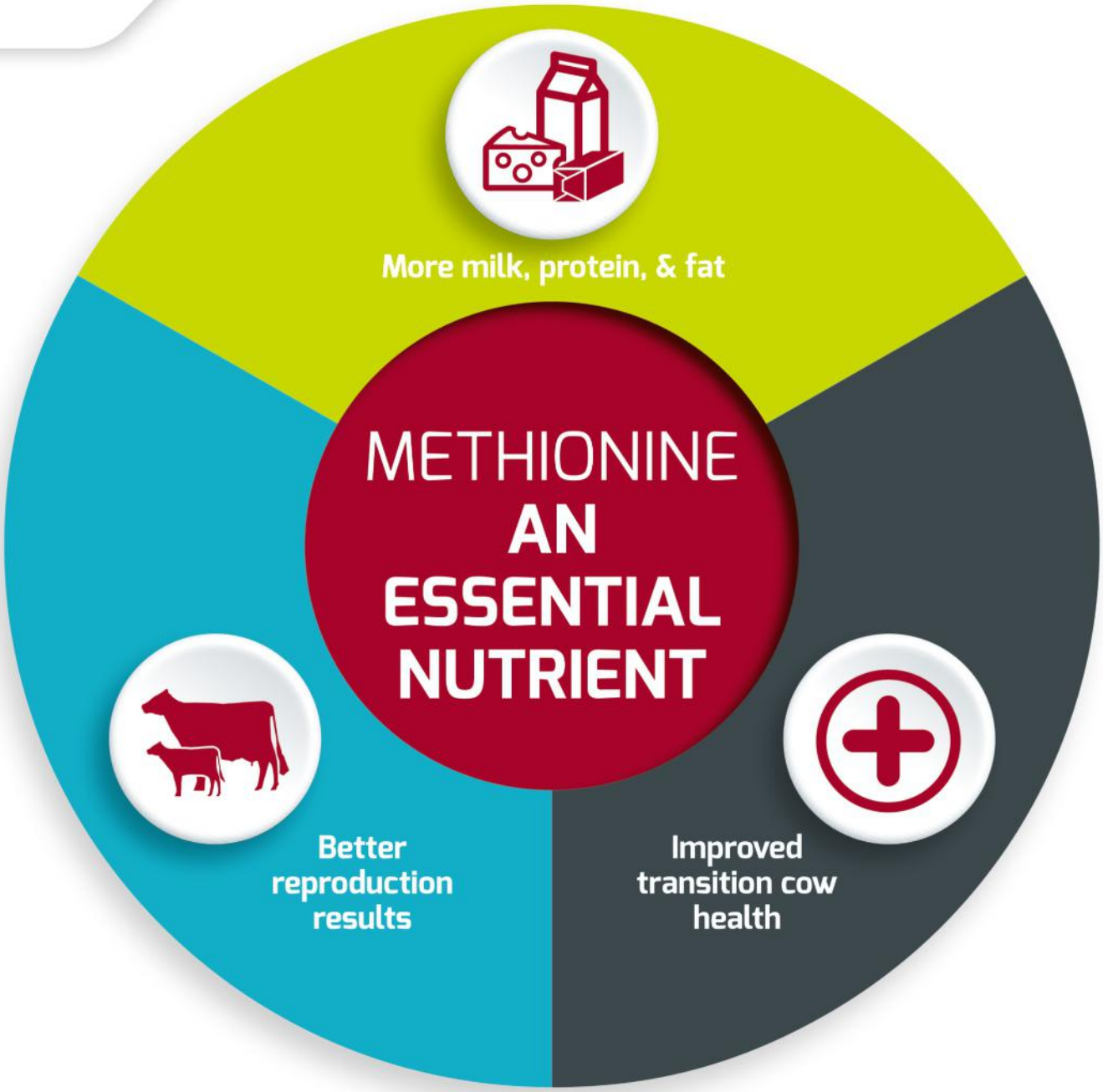

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From the Editor's Desk

Indian Dairy Sector Should Focus on Increasing Exports in 2024

As per data from the Animal Husbandry Ministry, India produced 230.58 MMT of milk during 2022-23. The milk production has increased by 3.83% over the previous year. The average yield per animal per day for crossbred is 8.55 kg and for indigenous/nondescript cows is 3.44 kg. The top five milk-producing states are Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujrat and Andhra Pradesh. They together contribute 53.08% of total milk production. In total milk production contribution of buffalo milk is 45%, cow milk is 52% and goat milk is 3%.

NDDB Chairman said that with India set to increase its share in global milk production over the next decade, it is time to look at expanding its share in the export market. India currently accounts for 24 per cent of the world's milk production. India's milk production has been growing at a CAGR of 6 per cent, while the world average is at 2 per cent. If this growth trend continues, over the next 7-10 years, we will have a one-third share in the global output. Our share in the world dairy market is less than 0.5 per cent. The dairy exports are largely targeted to cater to the demand of our diaspora. India is uniquely positioned to cater to the world market, especially to the countries in Southeast Asia, Sri Lanka, Bangladesh and also in West Asia which are import-dependent for milk products. The dairy value chain could be replicated in other food value chain segments to reduce wastage and improve supplies.

The growth rate of GVA (gross value added) in agriculture and allied sectors increased from 2.10 per cent in 2018-19 to 3.96 per cent in 2022-23. The government has adopted and implemented several policies, reforms, developmental programmes and schemes for improving the agricultural growth prospects and incomes of farmers since 2014. These have led to a rise in the GVA of the agriculture and allied sectors. The Budget allocation of the Union Ministry of Agriculture and Farmers' Welfare (including the Ministry of Cooperation, Department of Animal Husbandry and Dairying, and Department of Fisheries) was only ₹30,223.88 crore in 2013-14. This has been enhanced to ₹1,25,035.79 crore in 2023-24. As a per cent of the Government's total Budget outlay, allocation to the Ministry of Agriculture and Farmers' Welfare has increased from 1.8 per cent in 2013-14 to 2.8 per cent in 2023-24. The percentage of workers in the usual status engaged in agriculture and allied sector was at 45.8 per cent in 2022-23.

National Dairy Research Institute (NDRI) conducted an Interface to discuss challenges for the animal feed sector. Scientists and industry representatives brainstormed about how to increase the availability of unconventional feed and fodder resources for animal feeding. Due to the ban on the use of sugar for ethanol, more maize is expected to divert to produce ethanol. DDGS produced from this process will be available for animal feeding. Aflatoxin in feed resources results in aflatoxin in milk and milk products. The director of NDRI encouraged the industry to come forward for joint projects and to give their CSR funds to ICAR Institutes. NDRI will bring out a strategic paper about challenges and opportunities for the Indian animal feed sector. This paper will also highlight technologies available for adoption with ICAR.

Dairy Connect conducted a seminar for 1200 dairy farmers of Tamil Nadu at Erode. Speakers from all over India highlighted opportunities for boosting milk production in Tamil Nadu. Topics like feeding, breeding, housing management, and disease prevention were discussed. Tamil Nadu contributes 5% of India's total milk production (10.32 MMT) during 2022-23. Per capita milk availability in Tamil Nadu is 369 gm per person per day against the national average of 459 gm.

Gyan Dairy has increased its milk production capacity to 15 lakh litres a day from 11 lakh litres a day. The company has set up a plant in Gorakhpur with a capacity of 5 lakh litres a day. Over 1 lakh cattle-rearing families will be benefited. Uttar Pradesh dairy market is flourishing due to the State government's supportive policies. The government provides incentives and support for dairy development, including supporting milk cooperatives and rural milk producers and setting up greenfield dairies in cities such as Gorakhpur, Ayodhya, Kanpur, Lucknow and Bareilly. Technological advancements such as improved milk procurement networks are accelerating dairy product adoption. Road infrastructure improvements have facilitated direct milk transportation to dairy farmers, increasing income.

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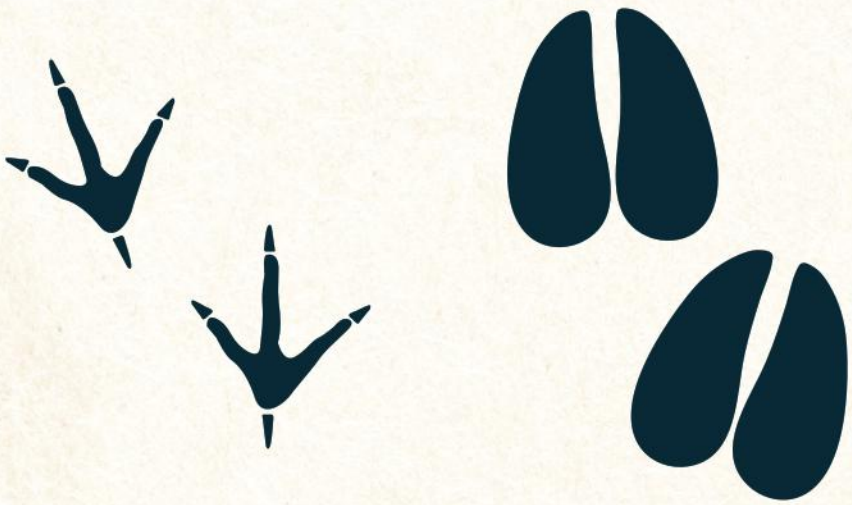

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ARTICLE

Use of Dried Distiller Grain Solubles as an Feed Ingredient in the Diets of Livestock

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Introduction

Identifying alternative fuels produced from plant biomass is essential due to the potential depletion of non-renewable energy sources plus the negative impact that burning them causes to the environment. Distillers' dried grain with soluble (DDGS) is a residual product obtained from the process of bioethanol fermentation. This process involves the use of dry milling technology on grains that are high in starch, such as corn, wheat, and barley. The present surge in bioethanol is driven by the demand for sustainable liquid fuels, particularly in the transportation industry. Due to its high content of crude protein, fat, fiber, vitamins, and minerals, DDGS is presently employed as feed for aquaculture, livestock, and poultry. DDGS has been utilized as a feedstock in the manufacturing of value-added goods through microbial fermentation in recent years.

Several investigations have documented the generation of organic acids, methane, biohydrogen, and hydrolytic enzymes by the utilization of DDGS. Pretreatment of DDGS is necessary to extract the fermentable sugars, despite the significant presence of macronutrients in DDGS. The pre-treatment procedures, which might be of chemical, physical, or biological origin, are employed either individually or in combination to achieve optimal yields for various applications.

Bioethanol Production Process and Types of Distillation Decoctions

The molecular formula of ethyl ethanol is C2H5OH and its calorific value is 19.6 MJ/L. There are two technological methods for extracting ethanol from corn: the wet and dry processes.The processes exhibit similarities however provide distinct outputs. Dry grinding enables a higher production capacity of bioethanol, with the sole additional byproduct being animal feed in the form of WDGS and DDGS. While employing wet technology, in combination to ethanol and animal feed, corn oil, corn syrup, and gluten are obtained. The production of ethanol necessitates a two-step process of starch fermentation. The initial step involves the breakdown of starch into glucose and maltose, while the subsequent step entails yeast fermentation, whereby disaccharides and monosaccharides are transformed into ethanol.

Enzymes and temperature degrade the polymeric structure of starch.The industrialized process employs two enzymes. The initial enzyme is ?-amylase, which functions to catalyze the hydrolysis of polymers into shorter chains (dextrins) that endure in the solution. This process is referred to as the condensation step. During the saccharification step, the presence of glucoamylase causes the conversion of dextrins into two types of simple sugars: glucose and maltose, which is a dimer of ?-1-4glucose.Yeast (Saccharomyces cerevisiae) ferments the resulting solution, converting glucose into carbon dioxide and alcohol. After the fermentation process is complete, the liquid is distilled, and the solid and liquid components of the decoction are separated using decanters. The decanters' solid contents are combined with the liquid's syrup after it has been evaporated and condensed. The resulting brew is centrifuged, dried, and then ground into granules.

Dried distillers' decoction can take several forms depending on the technology employed in its production: wet distillers' grain (WDG), wet distillers' grain with solubles(WDGS), and high-protein wet distillers' grains (HPWDG), as well as dried distillers' grain (DDG), dried grain with solubles(DDGS), and high-protein dried distillers grains (HPDDG).

Composition and Type of DDGS

Depending on the grains used in manufacture, there are several different varieties of DDGS. The composition of DDGS can also be influenced by the grains, the ethanol production technique, the production site, and the batch of grain.

Corn DDGS

Corn DDGS is the most common in India due to its high corn production. Another factor for corn's choice is its high fermentable starch content (Shurson and Noll 2005). Due to its widespread availability in animal feed, corn DDGS has been studied more than other feedstock grains. DDGS composition varies per corn type. The high protein and fat content of DDGS is the major reason it is fed to animals. Dry corn DDGS has 26%-33.3% crude protein. Different reports indicate 9.1% to 14.1% factor oil (Liu 2011). NDF can be 33-40% and ADF 11-20%. Chrenková et al; (2012) found that maize DDGS has more fat and less crude protein than other feedstock grains. Ash and total organic matter in the batch are also important.

DDGS Wheat

According to Chrenková et al. (2012), there are differences in the nutritional profiles of wheat DDGS and corn DDGS, particularly in terms of their variability. The wheat DDGS can exhibit a crude protein concentration ranging from 13.4% to 40.1% as seen in Table 1. The significant variability of wheat DDGS determines the level of uncertainty regarding its quality as animal feed. The fat content exhibits significant variability, ranging from 1.5% to 5.4%. Nevertheless, this quantity is considerably less than the fat content seen in maize DDGS.The NDF content in wheat DDGS is like that found in maize DDGS.

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Barley DDGS

Barley DDGS is a by-product of the brewery sector and constitutes a smaller proportion compared to other types of DDGS. According to Mustafa et al. (2000), the crude protein content in barley DDGS ranged from 14.9% to 15.9%. The fat percentage in barley DDGS is similarly reduced, ranging from 5.7% to 6.3%. Conversely, the barley DDGS has a higher fiber content compared to wheat or maize DDGS (Wu 1986). Barley DDGS contains a fiber content above 166 grams per kilogram. The study conducted by Mustafa et al. (2000) indicated that NDF, which constitutes a significant portion of crude fiber, accounted for 78.9-79.5%.

Combined Types of DDGS

One further approach to reduce the expense of ethanol manufacturing and enhance the viability of the production procedure is to employ a blend of various types of grains as feedstock. Multiple research projects provide information on the nutritional makeup of mixed DDGS. Weiss et al. (1989) state that DDGS is composed of 65% barley and 35% corn.The mixture analyzed in this study contains 38% neutral detergent fiber (NDF) and 27% crude protein content, as reported by Weiss et al. in 1989. A separate investigation documents many constituents including wheat, maize, barley, triticale, and sugar beet syrup (Böttger and Südekum 2017).The impact of these various combinations on the levels of crude protein and fiber content determines the effectiveness of the mixture in many applications, including its usage as animal feed.

Use of DDGS in Cattle

Calves need a lot of protein as they grow, and DDGS is a great way to meet that demand while also providing calories for their creep diets. Producers can improve cattle performance and lengthen the grazing season by feeding distillers dried grains with solubles (DDGS) to cattle on high forage diets. Depending on the situation and the animal's requirements, DDGS may be fed at a rate of 0.25 to 1.0% of body weight. DDGS, as a rich source of protein, can replace part of the total mix ration (TMR) to feed dairy cattle, while it can also be a source of energy to replace some of the grains .in dairy cow feed (Zhang et al., 2010). Feed efficiency improved somewhat when DDGS was used to replace some of the TMR (Kelzeret al., 2009). Milk yield, protein, and lactose content were all improved when DDGS was used to replace 20% of the barley grain or silage in the diet. There is no need to worry about acidosis in the rumen because rumen pH was not affected (Zhang et al., 2010).

Use of DDGS in Sheep and Goat

When used as a source of nutrition for sheep, DDGS has no effect on either animal health or milk production. However, DDGS can stand in for all or most of the soybean meal and up to 31% of the corn in goat diets. Feed intake, weight gain, and carcass quality can all be maintained when DDGS are included in a goat's diet (Maynard, 2015). Other writers have not shown that feeding DDGS reduces productivity in slaughter animals, alters the composition of the carcass, or changes the fatty acid profile of sheep meat. The scientists have also shown that DDGS is an excellent nutritional choice for sheep, increasing the weight of newborn lambs and having no effect on their mortality. Sheep TMR using DDGS is not as common as TMR with other livestock species (Sahin et al., 2013). Since DDGS contains a very high concentration of protein-the most expensive component for animal feeding - its use in sheep feeding is very cost-effective(Pezzanite et al., 2010).

Use of DDGS in Swine

DDGS can be included in pig diets during the entire life cycle. There is no evidence that feeding pregnant sows or growing piglets a diet that includes 30 percent distillers dried grains with solubles (DDGS) is harmful to either the sows or the piglets (Stein &Shurson, 2009). Pigs' growth and food consumption were aided because of this. The nursery diet must be really appealing. Reduced feed intake is seen when distiller's grains make about 25% of the diet. Therefore, most nutritionists advise limiting distiller's grains in the diets of growing and finishing pigs to no more than 20%. It seems that for lactating sows, a level of inclusion of around 20% is optimal. It appears that feeding lactating sows a diet that includes distillers also boosts feed consumption. If sows have been exposed to distillers before lactation begins, the sows will consume more feed throughout lactation. There may be health benefits to feeding pigs distillers. Piglets frequently suffer from proliferative ileitis, an inflammation of the piglet's ileum. The incidence and severity of this condition can be mitigated by adding 10% distillers grains.

Use of DDGS in Poultry

The simplest approach to combat the rising prices of soybean meal and yellow corn is to incorporate DDGS into chicken diets (El-Hacket al., 2019). DDGS is a rich source of xanthophylls, particularly Lutein and Zeaxanthin (Sommer burg et al., 1998). Maximum 25% incorporation of DDGS in broiler feed mix ration was advised by Waldroup et al. (1981). By boosting the yellow and red pigmentation of skin and egg, DDGS in chicken feed increases consumer demand for food products like eggs and broilers. Starter (0-16 days), grower (17-31 days), and finisher (32-42 days) DDGS levels in the poultry feed should not exceed 6%. Chickens fed a diet with a higher percentage of DDGS gained weight more efficiently (Lumpkins et al., 2004). For optimal egg weight and yolk color, El-Hacket al. (2019) suggested no more than a 12% DDGS inclusion in the hens' diet.

Conclusion

The growing inclination towards producing biofuel from maize ethanol results in a higher volume of byproducts derived from corn. The main byproduct generated in the production of bioethanol is known as DDGS (Dried Distillers Grains with Solubles). Plants, primarily by the process of dry-grinding procedure, which has been used as a commodity of minimal worth Feed for animals. The producers must Enhance the market appeal and functional applications of DDGS to Ensure the ethanol plant operation has a sustainable and prosperous economy.Although the nutritional value varies because of the raw material, DDGS's high nutritional value makes it a good source of nourishment for both humans and animals' components, procedures, etc.However, producers will be tasked with delivering DDGS that is both safe and of good quality to markets around the world.

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COMMON MINERAL DEFICIENCIES IN LIVESTOCK

Dr. Roshani Patil, Dr. Madhu Swamy, Dr. Yamini Verma, Dr. Amita Dubey and Dr. Maneesh Jatav.

Introduction

For livestock to function as a whole, mineral nutrition is essential. Mineral Apart from energy and proteinplay an important role in the metabolic functions of livestock. These functions support growth, development, production, immune function and reproductive performance. They are also essential for the support of several enzymatic systems. A borderline deficiency of a mineral needs to be supplemented to support the homeostatic state of the animal during all phases of life. Bioavailability plays an essential role in mineral significance.

Livestock may react negatively or not perform as expected if their mineral balance is out of balance. Mineral deficiencies can result from low quality feed, impaired absorption or assimilation in the body or increased demand for minerals during intensive growth, pregnancy and lactation. Mineral-deficient feed and diets with an unbalanced mineral content impair the growth and development of young animals, decrease appetite, lower nutrient absorption, decrease immunity and increase susceptibility to contagious diseases.

The term Essential Mineral is used in reference to a mineral that has been proven to have a metabolic role in the animal body. Twenty-two elements have been identifiedas essential to the growth and healthof animals.They include 7 macro elements and 15 microelements.

Minerals are classified into macro and micro minerals according to their quantitative requirement. Major macro minerals of structural and functional importance are calcium (Ca), phosphorous (P), magnesium (Mg), sulphur (S), sodium (Na), potassium (K), and chlorine (CI).Trace minerals or microminerals in the animal body are cobalt (Co), copper (Cu), zinc (Zn), iodine (1), iron (Fe), manganese (Mn), selenium (Se), molybdenum (Mo), and chromium (Cr).

Mineral Requirement (in ppm) for Cattle.

Minerals	Lactating cow	Dry cow	Growing calf
Ca	0.31	0.18	0.58
P	0.21	0.16	0.26
Mg	0.10	0.12	0.20
Na	0.07	0.07	0,10
K	0.60	0.60	0.70
S	0.15	0.15	0.15
Co	0.1	0.1	0.1
Cu	10.0	10.0	10.0
Iodine	0.50	0.50	0.50
Fe	50.0	50.0	50.0
Mn	20.0	40.0	40.0
Se	0.10	0.10	0.10
Zn	30.0	30.0	30.0

Problems Related to Mineral Deficiency	Possible Mineral Deficiency
Paralytic Problems	
1. Milk Fever	1. Phos Ratio: Vit. D, inorganic sulphate
2. Downer Milk Fever	2. The above plus magnesium
3. Grass Tetany	3. Magnesium
4. Knuckling fetlock Weak Hind	4. Selenium, Copper
5. leg Nerve Loss	5. Copper
6. Ataxia	6. Cooper
Breeding Problems	
1. Retained Placentas, metritis	1. Copper, zinc, selenium
2. Lack of oestrus	2. Copper, zinc, selenium
3. Tailless sperm in semen	3. Selenium
4. Lack of libido	4. Copper, molybdenum
Hoof Problems	
1. Hoof Rot	1. Copper, iodine
2. Abnormal hoof growth	2. Cooper
3. Soft hoof growth	3. Copper
4. Swollen Fetlocks	4. Copper
5. Laminitis	5. High rumen acid upsets copper absorption
6. Hairy wart resistance	6. Copper (nutrition), formaldehyde (foot bath)

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Metabolic Problems			
1.	High somatic cell count	1.	Copper, zinc, selenium
2.	Ketosis	2.	Copper, inorganic sulphate,
3.	Pneumonia	3.	Copper, zinc, selenium,
4.	Head abnormalities	4.	Cooper, selenium, magnesium
5.	Anaemia	5.	iron, copper, cobalt
6.	Retarded Growth	6.	Copper, molybdenum
7.	Sudden Death	7.	Copper, selenium, nitrate
8.	OB-Favor Mik	8.	High iron (feed or water or water, vitamin E)
9.	High culling rate	9.	Poor mineral nutrition program
10.	Fat Cow Syndrome	10.	Copper, inorganic sulphate
11.	Hair off colour, no bloom	11.	Copper, selenium
12.	Tongue lolling	12.	Copper
Intestinal problems			
1.	Acidosis	1.	Sodium bicarbonate
2.	Low butterfat test	2.	Sodium bicarbonate
3.	Undigested feed in manure	3.	Copper, cobalt
4.	Scouring	4.	Copper, molybdenum
5.	Worm resistance	5.	Copper, molybdenum
6.	Low production	6.	Copper zinc manganese inorganic sulphate
7.	Abnormal appetite	7.	Copper cobalt

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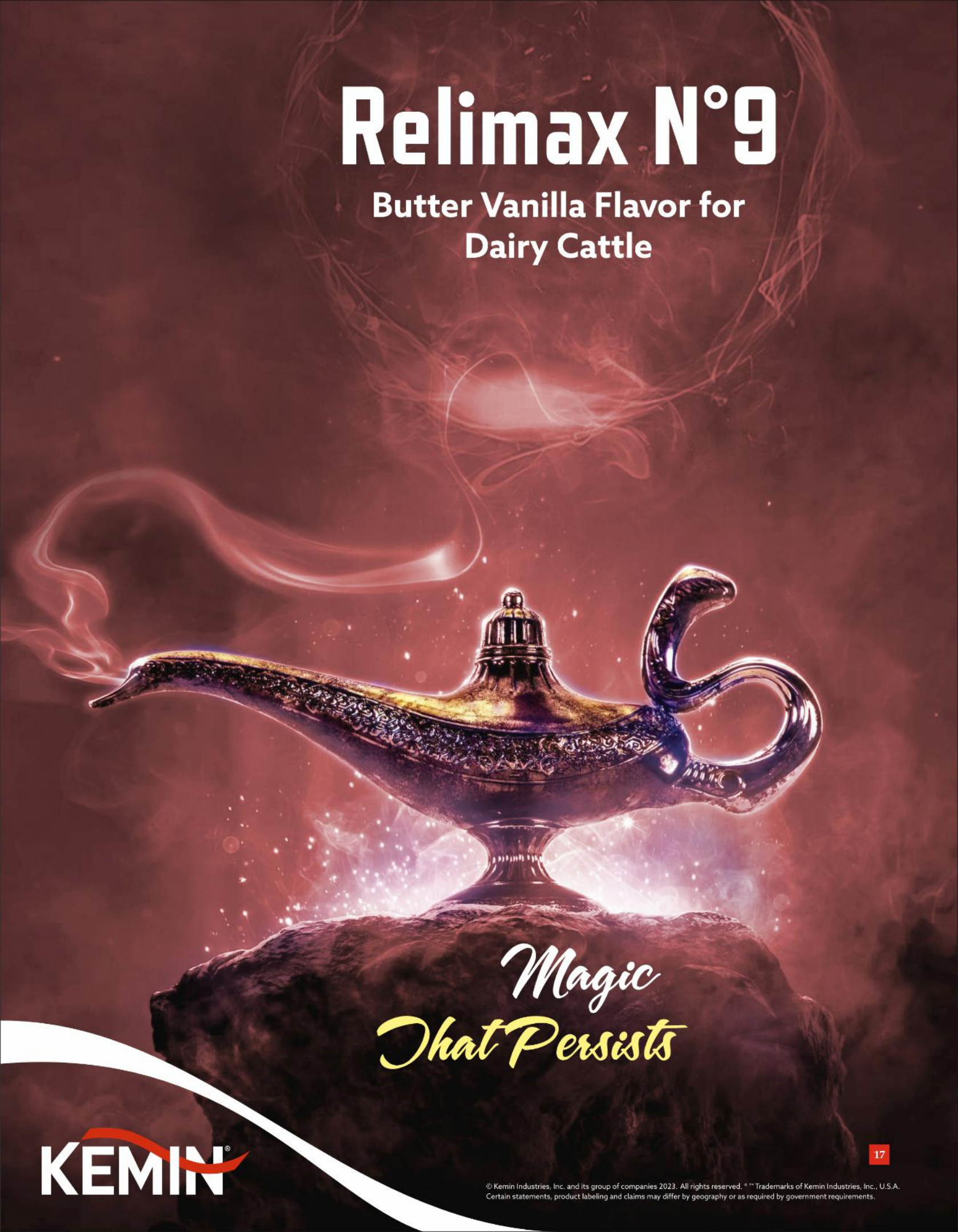

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ਲਵੇਰਿਆਂ ਲਈ ਢੁਕਵਾਂ ਤਾਪਮਾਨ 15 ਤੋਂ 25 ਡਿਗਰੀ ਸੈਂਟੀਗ੍ਰੇਡ ਹੁੰਦਾ ਹੈ, ਪਰ ਅਜਕਲ ਤਾਪਮਾਨ 10 ਡਿਗਰੀ ਦੇ ਆਸਪਾਸ ਚਲ ਰਿਹਾ ਹੈ। ਘੱਟ ਤਾਪਮਾਨ ਤੇ ਖਾਸ ਕਰਕੇ ਜੇ ਨਮੀ 80% ਤੋਂ ਵੱਧਦੀ ਹੈ, ਲਵੇਰੇ ਬਹੁਤ ਦਬਾਅ ਮਹਿਸੂਸ ਕਰਦੇ ਹਨ। ਇਸ ਸਥਿਤੀ ਦਾ ਟਾਕਰਾ ਕਰਨ ਲਈ ਉਹ ਖੁਦ ਕਈ ਯਤਨ ਕਰਦੇ ਹਨ। ਸੱਭ ਤੋਂ ਪਹਿਲਾਂ ਉਹ ਆਪਣੇ ਸਰੀਰਕ ਤਾਪਮਾਨ ਨੂੰ ਬਰਕਰਾਰ ਰੱਖਣ ਲਈ ਆਪਣੀ ਖ਼ੁਰਾਕ ਵਧਾਉਂਦੇ ਹਨ। ਬੈਠਣ ਨੂੰ ਸੁੱਕੀ ਅੱਤੇ ਨਿੱਘੀ ਜਗਾਹ ਲੱਭਦੇ ਹਨ। ਬਾਹਰ ਜੇ ਧੁੱਪ ਹੈ, ਤਾਂ ਉੱਥੇ ਜਾਣਾ ਚਾਹੁੰਦੇ ਹਨ ਅੱਤੇ ਪਾਣੀ ਘੱਟ ਪੀਦੇਂ ਹਨ। ਜੇ ਵੇਲੇ ਸਿਰ ਸਹੀ ਪ੍ਰੰਭਧ ਨਹੀਂ ਕੀਤੇ ਤਾਂ ਪੋਹ ਔਖਾ ਨਿਕਲੂ; ਦੁੱਧ ਵਧਣ ਦੀ ਥਾਂ ਘੱਟ ਸਕਦਾ ਹੈ ਅਤੇ ਬਿਮਾਰੀਆਂ ਅੱਲਗ ਤੋਂ ਸਹੇੜ ਲਵਾਂਗੇ। ਇਹੋ ਜਿਹੀਆਂ ਸਮਸਿਆਵਾਂ ਹਰ ਸਾਲ ਸਰਦੀਆਂ ਵੇਲੇ ਆਉਣੀਆਂ ਹੀ ਹਨ, ਸਾਨੂੰ ਸਮੇ ਸਿਰ ਤਿਆਰ ਰਹਿਣਾ ਚਾਹੀਦਾ ਹੈ।

ਕਿੱਲੇ ਨਾਲ ਬੰਨ੍ਹੇ, ਧੁੱਪ ਦਾ ਕੋਈ ਨਿਸ਼ਾਨ ਨਹੀ, ਖ਼ੁਰਲੀਆਂ ਤੂੜੀ/ਪਰਾਲੀ ਨਾਲ ਭਰੀਆਂ, ਸੱਸਤੀ ਤੋਂ ਸੱਸਤੀ ਬਾਜਾਰੀ ਫੀਡਾਂ,ਘਰ ਦੇ 5-10 ਕਿਲੋ ਪੱਠੇ(ਉਹ ਵੀ ਗਿਲੇ), ਬਨਉਟੀ ਵੜੇਵਿਆਂ ਦੀ ਖ਼ਲਾਂ ਤੇ ਉਲੀ ਵਾਲੇ ਛਾਣਾਂ ਨੇ ਲਵੇਰਿਆਂ ਨੂੰ ਬਿਮਾਰ ਹੀ ਕਰਨਾ ਹੈ। ਦੁੱਧ ਅੱਧਾ ਰਹਿ ਜਾਂਦਾ ਹੈ, ਦੁੱਧ ਵਿੱਚਲੀ ਫੈਟ ਤੇ ਗਰੈਵਿਟੀ ਸਦਕਾ ਰੇਟ ਵੀ ਸਹੀ ਨੀ ਮਿਲਦਾ। ਉਪਰੋਂ ਤੂ ਜਾਣ ਦੀ ਬਿਮਾਰੀ, ਲੇਵੇ ਦੀ ਸੋਜ, ਬੋਲਦੀ ਨਹੀਂ, ਠਹਿਰਦੀ ਨਹੀ, ਮੂੰਹ ਖ਼ੁਰ, ਗਲ਼ ਘੋਟੂ ਆਦਿ ਸਾਰੀਆਂ ਨਾਮੁਰਾਦ ਬਿਮਾਰੀਆਂ ਇਸੇ ਮੌਸਮ ਵਿੱਚ ਜ਼ਿਆਦਾ ਹੁੰਦੀਆਂ ਹਨ। ਬਰਸਾਤ ਤੋਂ ਬਾਅਦ ਵੱਧੀ ਹੋਈ ਨਮੀ ਤੇ ਚਲਦੀ ਹਵਾ ਹੋਰ ਵੀ ਘਾਤਕ ਹੁੰਦੀ ਹੈ। ਸਰਦੀਆਂ ਦਾ ਅਸਰ ਘੱਟ ਕਰਨ ਲਈ ਹੇਠ ਲਿਖੇ ਨੁਕਤੇ ਅਪਣਾਏ ਜਾ ਸਕਦੇ ਹਨ:

ਸ਼ੈੱਡ ਦੀ ਲੰਬਾਈ ਹਮੇਸ਼ਾ ਚੜਦੇ-ਲਹਿੰਦੇ ਪਾਸੇ ਦੀ ਹੋਣੀ ਚਾਹੀਦੀ ਹੈ। ਖ਼ੁਰਲੀ ਉਤਰ ਵਾਲੇ ਪਾਸੇ ਬਣਾਓ ਅਤੇ ਦੱਖਣ ਵਾਲਾ ਪਾਸਾ ਖੁੱਲਾ ਰੱਖੋ। ਅਜਿਹਾ ਕਰਨ ਨਾਲ ਪਸ਼ੂ ਸਰਦੀ ਤੋਂ ਬਚੇ ਰਹਿਣਗੇ ਕਿਉਂਕਿ ਦੱਖਣ ਤੋਂ ਸੂਰਜ ਦੀਆਂ ਕਿਰਨਾਂ ਸਿੱਧੀਆਂ ਸ਼ੈਡ ਅੰਦਰ ਇੱਕ ਤਾਂ ਨਿੱਘ ਦੇਣਗੀਆਂ ਤੇ ਫਰਸ਼ ਸੁੱਕਾ ਰਹੇਗਾ। ਇੱਕ ਲਵੇਰੀ 24 ਘੰਟਿਆਂ ਵਿੱਚੋਂ ਲਗਭਗ 15-16 ਘੰਟੇ ਬੈਠਣਾ ਚਾਹੁੰਦੀ ਹੈ। ਉਹ ਬੈਠ ਕੇ ਜੁਗਾਲੀ ਕਰਨਾ ਚਾਹੰਦੀ ਹੈ। ਉਸਨੂੰ ਬੈਠਣ ਵਾਲੀ ਜਗਾਹ ਨਰਮ ਚਾਹੀਦੀ ਹੈ, ਸੁੱਕੀ ਚਾਹੀਦੀ ਹੈ ਤੇ ਸਰਦੀਆਂ ਵਿੱਚ ਨਿਘੀ ਚਾਹੀਦੀ ਹੈ। ਜੇ ਸ਼ੈਡ ਦੇ ਅੰਦਰ ਦਰਖ਼ਤ ਹਨ ਤਾਂ ਬਹੁਤ ਹੀ ਵਧੀਆ, ਪਰ ਸਰਦੀਆਂ ਵੇਲੇ ਇਨਾਂ ਦੀਆਂ ਫਾਲਤੂ ਟਹਿਣੀਆਂ ਛਾਂਗ ਦਿਉ ਤਾਂ ਕਿ ਧੁੱਪ ਪੂਰੀ ਮਾਤਰਾ ਵਿੱਚ ਆ ਸਕੇ।

ਨਰਮ ਫਰਸ਼ ਨਾਲ ਜਿੱਥੇ ਲਵੇਰੀ ਨੂੰ ਆਰਾਮ ਮਿਲਦਾ ਹੈ, ਸੱਟਾਂ ਘੱਟ ਲਗਦੀਆਂ ਹਨ ਉਥੇ ਥੱਣਾਂ ਦਾ ਸੋਜਾ ਵੀ ਘੱਟ ਜਾਂਦਾ ਹੈ। ਬਿਨ੍ਹਾਂ ਅਰਾਮਦਾਇਕ ਫਰਸ਼ਾਂ ਸਦਕਾ ਲਵੇਰੇ ਲੰਗ ਮਾਰਨ ਲੱਗ ਜਾਂਦੇ ਹਨ।ਪਰਾਲੀ ਇੱਕ ਬਹੁਤ ਉਪਯੋਗੀ ਬਿੱਛ ਸਾਬਤ ਹੋਈ ਹੈ। 4-5 ਇੰਚ ਮੋਟੀ ਤਹਿ ਪਰਾਲੀ ਦੀ ਜੇ ਲਵੇਰਿਆਂ ਦੇ ਹੇਠਾਂ ਰੱਖੀਏ (ਖਾਸ ਕਰਕੇ ਸਰਦੀਆਂ'ਚ) ਤਾਂ ਉਹ ਲੰਬਾ ਸਮਾਂ ਬਹਿੰਦੀਆਂ ਹਨ, ਜੁਗਾਲੀ ਵੱਧ ਕਰਦੀਆਂ ਹਨ, ਦੁੱਧ ਵੀ ਵਧਾਉਦੀਆਂ ਹਨ। ਨਵ ਜੰਮੇ ਕੱਟਰੂ-ਵੱਛੜੂ ਲਈ ਪਰਾਲੀ ਬਹੁਤ ਹੀ ਲਾਭਦਾਇਕ ਸਿੱਧ ਹੁੰਦੀ ਹੈ; ਇਹ ਫਾਲਤੂ ਨਮੀ ਸੋਕ ਸਕਦੀ ਹੈ, ਨਵ ਜੰਮੇ ਨੂੰ ਸੱਟ, ਫਿਸਲਣ ਦਾ ਖੱਤਰਾ ਘੱਟਦਾ ਹੈ, ਨਿੱਘ ਮਿਲਦਾ ਹੈ। ਪਰਾਲੀ ਫਾਲਤੂ ਅਮੋਨੀਆਂ ਗੈਸ ਵੀ ਬਣਨ ਨਹੀਂ ਦਿੰਦੀ, ਮੋਕ ਘੱਟ ਲੱਗਦੀ ਹੈ। ਅੱਜਕਲ ਬਜਾਰ'ਚ ਵਿੱਕ ਰਹੇ ਰੱਬੜ/ਪਲਾਸਟਿਕ ਦੀਆਂ ਦਰੀਆਂ ਨਾਲੋਂ ਪਰਾਲੀ ਦੀ ਸੁੱਕ ਸੱਸਤੀ ਪੈਂਦੀ ਹੈ। ਇਸਨੂੰ 4-5 ਦਿਨਾਂ ਬਾਅਦ ਵਰਤ ਕੇ ਕੰਪੋਸਤ ਬਣਾ ਲੈਣੀ ਚਾਹੀਦੀ ਹੈ।

ਸ਼ੈੱਡ ਅੰਦਰ ਸਾਫ ਸੁਥਰੇ ਪੀਣ ਵਾਲੇ ਪਾਣੀ ਦੀ ਵਿਵਸਥਾ ਸਹੀ ਹੋਣੀ ਚਾਹੀਦੀ ਹੈ। ਸਰਦੀਆਂ ਵਿੱਚ ਪਾਣੀ ਦੀ ਮਿਕਦਾਰ ਘੱਟ ਜਾਂਦੀ ਹੈ। ਦੁੱਧ ਦੀ ਚੋਆਈ ਤੋਂ ਅਕਸਰ ਬਾਅਦ ਲਵੇਰੇ ਪਾਣੀ ਪੀਣਾ ਚਾਹੁੰਦੇ ਹਨ ਇਸ ਕਰਕੇ ਪਾਣੀ ਵਾਲੀ ਹੌਦੀ ਤੇ ਜ਼ਿਆਦਾ ਇੱਕਠ ਨਾ ਹੋਣ ਦਿਉ। ਦਸ ਪਸ਼ੂਆ ਲਈ 8 ਫੁੱਟ ਲੰਬੀ ਅਤੇ 3 ਫੁੱਟ ਚੌੜੀ ਪਾਣੀ ਦੀ ਕੁੰਡ ਕਾਫੀ ਹੈ। ਇਸ ਦੀਆਂ ਕੰਧਾ ਉੱਤੇ ਕਲੀ ਦਾ ਲੇਪ ਜਰੂਰ ਕਰੋ। ਅਜਿਹਾ ਕਰਨ ਨਾਲ ਕੰਧਾ ਉੱਤੇ ਹਰਿਆਲੀ (ਕਾਈ) ਨਹੀਂ ਜੰਮਦੀ । ਹਰੇਕ 15 ਦਿਨਾਂ ਬਾਅਦ ਪਾਣੀ 'ਚ ਪਾਈ ਕਲੀ ਬਦਲ ਦਿਓ। ਪਾਣੀ ਵਾਲੀ ਮੋਟਰ ਹਰ 2-3 ਘੰਟਿਆਂ ਬਾਅਦ ਚਲਾਉ ਤਾਂ ਕਿ ਪਾਣੀ ਤਾਜਾ ਤੇ ਨਿਘਾ ਮਿਲੇ, ਨਹੀਂ ਤਾਂ ਲਵੇਰਿਆਂ ਨੇ ਰੱਜਵਾਂ ਪਾਣੀ ਨਹੀਂ ਪੀਣਾਂ। ਜੇ ਪੀ ਵੀ ਲਿਆ ਤਾਂ ਪਾਣੀਂ ਦੇ ਘੱਟ ਤਾਪਮਾਨ ਕਾਰਨ, ਉਝਰੀ ਅੰਦਰ ਜੀਵਾਣੂਆਂ ਤੇ ਮਾੜਾ ਅਸਰ ਪੈਂਦਾ ਹੈ ਤੇ ਕਈ ਵਾਰ ਲਵੇਰੇ ਨਮੋਨੀਏ ਦੇ ਸ਼ਿਕਾਰ ਹੋ ਸੱਕਦੇ ਹਨ।

ਜੇ ਕਰ ਦੁੱਧ ਘੱਟ ਜਾਏ, ਫੈਟ-ਗਰੈਵਿਟੀ ਨਾ ਬਣੇ, ਲਵੇਰਾ ਬੋਲੇ ਨਾ, ਠਹਿਰੇ ਨਾ, ਬੱਚਾ ਸਿਟ ਜਾਏ, ਜੇਰ ਅੜ ਜਾਏ, ਲੇਵਾ ਸੁੱਜ ਜਾਏ ਤਾਂ ਇਲਾਜ ਕਰਨ ਵਾਲਿਆ ਸਿਆਣਿਆਂ ਨੇ ਖ਼ੁਰਾਕ ਦਾ ਨੁਕਸ ਤਾਂ ਕਢਣਾ ਹੀ ਹੈ। ਪਰ ਇਥੇ ਤਾਂ ਮਸਲਾ ਸਰਦੀਆਂ ਵਿੱਚ ਦੁੱਧ ਘੱਟਣ ਦਾ ਹੈ। ਸਾਡੇ ਯਤਨ ਲਵੇਰਿਆਂ ਨੂੰ ਵੱਧ ਤੋਂ ਵੱਧ ਖ਼ੁਰਾਕ ਖੁਆਉਣ ਦੇ ਹੋਣੇ ਚਾਹੀਦੇ ਹਨ। ਲਵੇਰੇ ਦੀ ਪਹਿਲੀ ਪੰਸਦ ਹਰਾ ਚਾਰਾ ਹੁੰਦਾ ਹੈ, ਜੇ ਰੱਜਵੇਂ ਦੀ ਗ਼ਲ਼ ਕਰੀਏ ਤਾਂ ਘੱਟੋ ਘੱਟ 35-40 ਕਿਲੋ ਪ੍ਰਤੀ ਦਿਨ ਮਿਲਣਾ ਚਾਹੀਦਾ ਹੈ। ਇਹ ਮਿਲਣਾ ਮੁਸ਼ਕਲ ਹੈ ਕਿਉਂਕਿ ਇਸ ਲਈ 5-6 ਲਵੇਰਿਆਂ ਲਈ ਇਕ ਕਿਸਾਨ ਕੋਲ ਇਕ ਕਿਲਾ ਚਾਰਿਆਂ ਹੇਠ ਰੱਕਬਾ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ। ਪਹਿਲੀ ਗ਼ਲ਼ ਚਾਰਾ ਪੂਰਾ ਹੈ ਨਹੀ ਦੂਸਰਾ ਜਿਹੜਾ ਵੀ ਹੈ ਉਸਨੂੰ ਕੱਦ ਕੱਟਿਆ ਇਹ ਜਰੂਰੀ ਹੈ। ਹਰੇ ਚਾਰੇ ਦੀ ਖ਼ੁਰਾਕੀ ਗੁਣਵੰਤਾ ਉਸ ਦੀ ਕਟਾਈ ਤੇ ਨਿਰਭਰ ਕਰਦੀ ਹੈ। ਜੇ ਪਹਿਲਾਂ ਵੱਢ ਲਿਆਂ ਤਾਂ ਚਾਰਾ ਨਰਮ ਹੋਊ, ਸਰਦੀਆਂ ਵਿੱਚ ਹਰੇ ਵਿਚ ਪਾਣੀ ਦੀ ਮਾਤਰਾ ਜ਼ਿਆਦਾ ਹੋਣ ਕਰਕੇ ਮੋਕ ਲਗਣ ਦਾ ਖਤਰਾ, ਜੇ ਬਾਅਦ'ਚ ਕੱਟਿਆ ਤਾਂ ਕੈੜਾ ਹੋਜੂ, ਨਹੀ ਖਾਣਾ। ਅੱਜਕਲ ਬਰਸੀਮ, ਜਵੀ, ਲੂਸਣ, ਰਾਈ ਘਾਹ ਆਦਿ ਬੀਜੇ ਜਾਂਦੇ ਹਨ, ਜਿੰਨ੍ਹਾਂ ਵਿੱਚ ਪ੍ਰੋਟੀਨ ਅੱਤੇ ਕੈਲਸ਼ਿਅਮ ਦੀ ਮਾਤਰਾ ਸਾਉਣੀ ਦੇ ਚਾਰਿਆਂ ਨਾਲੋਂ ਜ਼ਿਆਦਾ ਹੁੰਦੀ ਹੈ। ਸ਼ੁਰੂ ਸ਼ੁਰੂ ਥੋੜਾ ਚਿਰ ਦੁੱਧ ਵੱਧਦਾ ਹੈ ਫਿਰ ਖੂਨ ਵਿਚਲਾ ਯੂਰੀਆ ਵਧਣ ਸਦਕਾ ਕਈ ਬਿਮਾਰੀਆਂ ਦਾ ਕਾਰਣ ਬਣਦਾ ਹੈ। ਇਸੇਤਰ੍ਹਾਂ ਵੱਧ ਕੈਲਸ਼ੀਅਮ ਸਦਕਾ ਫਾਸਫੋਰਸ ਦੀ ਕਮੀ ਹੁੰਦੀ ਹੈ ਤੇ ਕਈ ਲਵੇਰੇ ਇੱਕ ਦੂਜੇ ਦਾ ਪਿਸ਼ਾਬ ਪੀਣ ਲੱਗ ਜਾਂਦੇ ਹਨ ਤੇ ਸਿਆਣਿਆਂ ਨੇ ਧਾਂਤਾਂ ਦੇ ਚੂਰੇ ਦੇ ਨੁਕਸ ਕੱਢ ਦੇਣੇ ਹਨ। ਇਸ ਕਰਕੇ ਸਰਦੀਆਂ ਵਿੱਚ ਆਪਣੇ ਹਰੇ ਚਾਰੇ ਨੂੰ ਮੁੱਖ ਰੱਖਕੇ ਵੰਡ ਵਿੱਚ ਤਬਦੀਲੀ ਕਰੋ। ਕੁੱਝ ਖ਼ਲਾਂ ਘੱਟਾਕੇ ਅਨਾਜ ਵਧਾਉ । ਸਰਦੀਆਂ'ਚ ਕੈਲਸ਼ੀਅਮ ਦੀ ਪੀਪੀਆਂ ਦੀ ਵਰਤੋਂ ਘੱਟ ਕਰੋ।

ਹਰੇ ਵਿੱਚਲੀ ਵੱਧ ਨਮੀ ਕਾਰਣ ਇਕ ਕਿਸਾਨ ਨੂੰ ਤੂੜੀ/ਪਰਾਲੀ ਦਾ ਸਹਾਰਾ ਲੈਣਾਂ ਪੈਂਦਾ ਹੈ। ਇਹ ਸਿਰਫ ਢਿੱਡ ਭਰ ਸਕਦੇ ਹਨ, ਗੋਹਾ ਲੈਣ ਲਈ। ਦੁੱਧ ਲਈ ਤਾਂ ਹਰਾ ਰੀੜ ਦੀ ਹੱਡੀ ਮੰਨਿਆ ਜਾਂਦਾ ਹੈ। ਯੂਰੀਏ ਨਾਲ ਸੋਧੀ ਹੋਈ ਤੂੜੀ/ਪਰਾਲੀ ਵੀ ਪ੍ਰਚੱਲਤ ਨਹੀ ਹੋ ਸਕੀ। ਜਦ ਤੂੜੀ/ਪਰਾਲੀ ਪੈਣੀ ਹੈ ਤਾਂ ਫਿਰ ਖ਼ੁਰਾਕੀ ਜਰੂਰਤਾਂ ਪੂਰੀਆਂ ਕਰਨ ਲਈ ਸਰਦੀਆਂ ਦੇ ਮੌਸਮ ਵਿੱਚ ਵੰਡ ਦੀ ਭੂਮਿਕਾ ਹੋਰ ਵੀ ਵੱਧ ਜਾਂਦੀ ਹੈ ਕਿਉਂਕਿ ਲਵੇਰੇ ਨੂੰ ਰਜਾਉਣ, ਪੈਦਾਵਾਰ ਵਧਾਉਣ ਲਈ ਕਈ ਕਿਸਮਾਂ ਦੇ ਸੂਖਮ ਪਦਾਰਥਾਂ ਦੀ ਜਰੂਰਤ ਪੈਂਦੀ ਹੈ।

ਵੰਡ ਵਿਚ ਪਾਏ ਜਾਣ ਵਾਲੇ ਅਨਾਜ, ਖਲ੍ਹਾਂ, ਪਾਲਿਸ਼ ਆਦਿ ਦੀ ਕੁਆਲਿਟੀ ਦਾ ਧਿਆਨ ਰਖੋ। ਮੱਕੀ ਦਾ ਦਾਣਾ ਵੱਡਾ, ਸੁਸਰੀ ਤੇ ਉੱਲੀ ਰਹਿਤ ਹੋਣਾ ਚਾਹੀਦਾ ਹੈ । ਇਸ ਵਿਚ ਨਮੀ ਦਾ ਪੱਤਾ ਚੱਬ ਕੇ ਚਲ ਜਾਂਦਾ ਹੈ । ਖਲ੍ਹਾਂ ਗਾਹੜੇ ਭੂਰੇ ਰੰਗ ਦੀਆਂ ਚਾਹੀਦੀਆਂ ਹਨ । ਪਾਪੜੀਆਂ ਖੱਲ੍ਹ ਦੋਹਾਂ ਉਗਲ੍ਹਾਂ ਵਿਚਾਲੇ ਰੱਖ ਕੇ ਅੰਗੂਠੇ ਨਾਲ ਆਸਾਨੀ ਨਾਲ ਟੁਟਣੀ ਚਾਹੀਦੀ ਹੈ । ਜਿੰਨੀਆਂ ਵੀ ਬਗੈਰ ਤੇਲ ਵਾਲੀਆਂ ਖਲ੍ਹਾਂ ਹੋਣ ਉਨ੍ਹਾਂ ਵਿਚ ਰੇਤੇ ਦੀ, ਛਿੱਲਕੇ ਦੀ ਮਿਲਾਵਟ ਨਾ ਹੋਵੇ। ਚੂਰੀਆਂ ਵਿਚ ਵੀ ਛਿਲਕਿਆਂ ਦੀ ਮਿਲਾਵਟ ਨਾ ਹੋਵੇ । ਬਿਨੌਲਾ ਖਲ੍ਹ ਨੂੰ ਤੋੜਨ ਤੇ ਆਸਾਨੀ ਨਾਲ ਟੁੱਟ ਜਾਏ ਤੇ ਟੁੱਟਦਿਆਂ ਵਿਚਾਲੋਂ ਰੇਸ਼ੇ ਦਿਖਦੇ ਹੋਣ । ਪਾਲਿਸ਼ ਵਿੱਚ ਵੀ ਕੋਈ ਕਿਰਕੀ ਨਾ ਹੋਵੇ । ਪਾਲਿਸ਼ ਨੂੰ ਹਥੇਲੀ ਵਿਚ ਦਬਾਉਣ ਤੇ ਉਂਗਲਾਂ ਛੱਪਣ । ਫੁਲ ਫੈਟ ਸੋਇਆ, ਬਿਨ੍ਹਾਂ ਰੂੰ ਦੇ ਸਾਬਤ ਵੜੇਵੇਂ, ਡੀ. ਡੀ. ਜੀ. ਐਸ., ਬਾਈ ਪਾਸ ਪ੍ਰੋਟੀਨ ਹਰ ਫੀਡ ਮਿੱਲ 'ਚ ਨਹੀਂ ਮਿਲਦੇ । ਅੱਜ ਕੱਲ੍ਹ ਬਾਜ਼ਾਰ ਵਿੱਚ ਕਈ ਕਿਸਮ ਦੇ ਧਾਤਾਂ ਤੇ ਚੂਰੇ, ਚੀਲੇਟਡ ਧਾਤਾਂ, ਟ੍ਰੇਸ ਮਿਨਰਲ, ਬਾਈ ਪਾਸ ਫੈਟਾਂ ਅਤੇ ਕਈ ਕਿਸਮ ਦੇ ਬਫਰ ਆਦਿ ਮਿਲਦੇ ਹਨ । ਇਨ੍ਹਾਂ ਦੀ ਵਰਤੋਂ ਕਰਨ ਤੋਂ ਪਹਿਲਾਂ ਇਨ੍ਹਾਂ ਵਿਚਲੇ ਮਿਆਰ, ਕੁਆਲਿਟੀ, ਕਿੰਨੀ ਮਾਤਰਾ ਵਿੱਚ ਪਾਉਣਾ ਹੈ; ਚੰਗੀ ਤਰ੍ਹਾਂ ਪੜ੍ਹ ਲਉ, ਵਿਚਾਰ ਕਰੋ ਜਾਂ ਸਲਾਹ ਲਵੋ ।ਹੋ ਸਕੇ ਤਾਂ ਨਮਕ ਆਇਉਡਾਈਜ਼ਡ ਹੀ ਵਰਤੋਂ ਤਾਂ ਕਿ ਜਾਨਵਰ ਵਕਤ ਸਿਰ ਹੇਹੇ ਵਿਚ ਆਏ ਤੇ ਆਇਉਡੀਨ ਦੇ ਟੀਕੇ ਨਾ ਲੁਆਣੇ ਪੈਣ ।

ਆਮ ਹਲਾਤਾਂ ਵਿੱਚ 15 ਲਿਟਰ ਦੁੱਧ ਦੇਣ ਵਾਲੀ ਮੱਝ ਇਕ ਦਿਨ ਦਾ 7 ਕਿਲੋ ਵੰਡ ਖਾ ਸਕਦੀ ਹੈ। ਪਰ ਅਜਕਲ ਸਰਦੀਆਂ ਕਾਰਣ ਇਸਨੂੰ 8-8.5 ਕਿਲੋ ਵੰਡ ਮਿਲਣਾ ਚਾਹੀਦਾ ਹੈ, ਜਿਹੜਾ ਕਿ ਨਹੀਂ ਮਿਲਦਾ। ਇਸ ਲਈ 7 ਕਿਲੋ ਵਾਲੇ ਤੱਤ ਸਾਨੂੰ ਹੁਣ 8 ਕਿਲੋ ਤੋਂ ਪੂਰੇ ਕਰਨੇ ਚਾਹੀਦੇ ਹਨ।ਜਿੱਸ ਕਰਕੇ ਸਰਦੀਆਂ ਵਿੱਚ ਵੰਡ

ਹਮੇਸ਼ਾਂ ਸੱਸਤਾ ਬਣਦਾ ਹੈ ਪਰ ਲਵੇਰਿਆਂ ਨੂੰ ਜ਼ਿਆਦਾ ਚਾਹੀਦਾ ਹੈ।ਡੇਅਰੀ ਪਾਲਕ ਉਹੀ ਮਿਕਦਾਰ ਪਾਈ ਜਾਂਦੇ ਹਨ, ਨਤੀਜਾ ਦੁੱਧ ਘੱਟਣਾ ਸ਼ੁਰੂ ਹੋ ਜਾਂਦਾ ਹੈ ਕਿਉਂਕਿ ਲਵੇਰੇ ਨੇ ਬਹੁਤੀ ਊਰਜਾ ਆਪਣੇ ਸਰੀਰਕ ਤਾਪਮਾਨ ਨੂੰ ਬਰਕਰਾਰ ਰਖਣ ਲਈ ਵਰਤਣੀ ਹੈ। ਯਾਦ ਰੱਖੋ ਕਿ ਖੁਰਾਕੀ ਤੱਤ ਜਰੂਰੀ ਹਨ ਨਾ ਕਿ ਜਿਣਸਾਂ।ਅਜਕਲ ਮੱਕੀ ਬਹੁਤ ਮਹਿੰਗੀ ਹੋ ਗਈ ਹੈ, ਜੇ ਕੁਆਲਿਟੀ ਵਾਲੀ ਮਿਲਦੀ ਹੈ ਤਾਂ ਇਸਤੇਮਾਲ ਕਰੋ। ਬਾਜਰਾ ਵੀ ਉਪਲੱਭਦ ਹੈ, ਇਸਦਾ ਉਪਯੋਗ ਕਰਕੇ ਵੰਡ ਸੱਸਤਾ ਬਣਾਇਆ ਜਾ ਸੱਕਦਾ ਹੈ। ਘਰ ਦੀ ਕਣਕ ਜੇ ਹੈ ਤਾਂ ਇਹ ਵੀ ਗੁਣਕਾਰੀ ਸਿੱਧ ਹੋਏਗੀ।ਸ਼ੀਰਾ ਸੱਸਤਾ ਹੈ, ਇਸ ਵਿਚਲੇ ਪੋਟਾਸ਼ੀਅਮ ਸਦਕਾ ਦੁੱਧ ਵਿੱਚ ਵਾਧਾ ਹੁੰਦਾ ਹੈ। ਸਰੋਂ ਦੀ ਖ਼ਲ ਦੋ ਤਰ੍ਹਾਂ ਦੀ ਉਪਲਭਦ ਹੈ; ਪਾਪੜੀ ਜਾਂ ਬਿਨਾ ਤੇਲ ਵਾਲੀ । ਪਰ ਬਹੁਤੇ ਪਸ਼ੂ ਪਾਲਕ ਸਰੋਂ ਦੀ ਖ਼ਲ ਨੂੰ ਕੌੜੀ ਖ਼ਲ ਕਹਿ ਕੇ ਇਸ ਦੀ ਵਰਤੋਂ ਤੋਂ ਗੁਰੇਜ ਕਰਦੇ ਹਨ। ਸਰੋਂ ਦੀ ਖ਼ਲ ਬਹੁਤ ਉਪਯੋਗੀ ਹੈ, ਇਸ ਦੀ ਵਧੇਰੇ ਵਰਤੋਂ (ਪਸ਼ੂ ਨੂੰ ਗਿਝਾ ਕਿ) ਨਾਲ ਦੁੱਧ ਬਣਿਆ ਰਹਿੰਦਾ ਹੈ। ਵੜੇਵੇਂ ਜਾਂ ਵੜੇਵਿਆਂ ਦੀ ਖ਼ਲ ਦੀ ਵਰਤੋਂ ਲੋੜ ਨਾਲੋਂ ਵੱਧ ਹੀ ਹੈ, ਫੈਟ ਦੀ ਪ੍ਰਾਪਤੀ ਲਈ। ਇਸ ਵਿਚਲੇ ਰੇਸ਼ੇ ਕਰਕੇ ਦੁੱਧ ਦੀ ਫੈਟ ਵੱਧਦੀ ਹੈ ਪਰ ਮਹਿੰਗੀ ਹੈ, ਮਿਲਾਵਟੀ (ਧੁਪਲਚਿਓਟਏ) ਮਿਲਦੀ ਹੈ, ਉਲੀ ਲੱਗੀ, ਬਾਰਦਾਨਾ, ਕੰਬਲ ਦੇ ਰੇਸ਼ੇ ਅਕਸਰ ਇਸ ਵਿਚ ਰਲੇ ਹੰਦੇ ਹਨ। ਜੇ ਕਿਧਰੇ ਸੂਰਜਮੁਖੀ ਦੀ ਖ਼ਲ ਮਿਲ ਜਾਏ ਤਾਂ ਬਹੁਤ ਵੱਧੀਆ।ਜੇ ਕਰ ਆਪਣੇ ਲਵੇਰੇ ਗੁਆਰ ਕੋਰਮੇ ਤੇ ਗਿਝਾਏ ਹੋਏ ਹਨ ਤਾਂ ਇਹ ਇਕ ਬਹੁਤ ਸੱਸਤਾ ਬਾਈਪਾਸ ਪ੍ਰੋਟੀਨ ਦਾ ਸੋਮਾ ਹੈ। ਅਜਕਲ ਮੱਕੀ ਤੇ ਚੌਲਾਂ ਦਾ ਡੀ.ਡੀ.ਜੀ.ਐਸ. ਵੀ ਉਪਲੱਭਦ ਹੈ, ਇਸ ਦੀ ਮਾਤਰਾ 5-7 ਕਿਲੋ ਹੀ ਰੱਖੋ, ਵਧੇਰੇ ਮਾਤਰਾ ਨਾਲ ਮੋਕ ਲਗ ਸਕਦੀ ਹੈ।

ਜਦ ਵੀ ਕੋਈ ਚੀਜ਼ ਸਵਾਦ ਬਣਾਉਣੀ ਹੋਏ ਤਾਂ ਅਕਸਰ ਘਿਓ ਦਾ ਇਸਤੇਮਾਲ ਹੰਦਾ ਹੈ।ਰਾਈਸ ਪਾਲਿਸ਼ ਅਜਕਲ ਵਧੀਆ ਮਿਲ ਰਹੀ ਹੈ ਇਸ ਲਈ ਇਸਨੂੰ 8-10 ਕਿਲੋ ਪ੍ਰਤੀ ਕੁਇੰਟਲ ਵਰਤਿਆ ਜਾ ਸੱਕਦਾ ਹੈ। ਤੇਲ ਦੀ ਪੂਰਤੀ ਲਈ ਫੁਲ ਫੈਟ ਸੋਇਆ, ਸਰ੍ਹੋਂ ਦੀ ਖ਼ਲ ਅਤੇ ਬਾਈਪਾਸ ਫੈਟ ਦੀ ਵਰਤੋਂ ਵੀ ਕੀਤੀ ਜਾ ਸਕਦੀ ਹੈ। ਪਰ ਬਾਈਪਾਸ ਫੈਟ ਦੀ ਕੁਆਲਿਟੀ ਚੈਕ ਕਰਨ ਦੀ ਜ਼ਿਮੇਦਾਰੀ ਕਿਸਾਨ ਦੀ ਆਪਣੀ ਹੈ।ਬਹੁਤੇ ਪਸ਼ੂ ਪਾਲਕ ਭਾਅ ਹੀ ਦੇਖਦੇ ਹਨ ਕਿ ਕਿਹੜੀ ਸੱਸਤੀ ਹੈ, ਇਸ ਫੈਟ ਵਿਚਲੀ ਊਰਜਾ; ਇਸ ਨੂੰ ਬਣਾਉਣ ਦੇ ਤਰੀਕੇ ਤੇ ਨਿਰਭਰ ਕਰਦੀ ਹੈ। ਬਾਈਪਾਸ ਫੈਟ ਅੱਧਾ ਕਿਲੋ ਤੋਂ ਲੈ ਕੇ ਦੋ ਕਿਲੋ ਪ੍ਰਤੀ ਕੁਇੰਟਲ ਵਰਤੀ ਜਾ ਸਕਦੀ ਹੈ। ਇਸ ਨੂੰ ਗਿਲਾ ਨਾ ਕਰੋ ਨਹੀਂ ਤਾਂ ਲਵੇਰੇ ਨਹੀਂ ਖਾਣਗੇ।

ਸਰਦੀਆਂ ਵਿਚ ਵੱਧ ਖਾਣ ਨਾਲ ਇਕ ਲਵੇਰੀ ਤੇਜਾਬੀ ਪਣ ਦਾ ਸ਼ਿਕਾਰ ਹੋ ਸੱਕਦੀ ਹੈ। ਜੁਗਾਲੀ'ਚ ਕਮੀ ਹੋਏਗੀ ਜਿਸ ਕਰਕੇ ਥੁੱਕ ਵੀ ਘੱਟ ਬਣੂਗਾ। ਇਸ ਕਰਕੇ ਉਝਰੀ ਵਿਚ ਤੇਜਾਬ ਦੀ ਮਾਤਰਾ ਵੱਧ ਸਕਦੀ ਹੈ । ਬਫਰ ਦੀ ਵਰਤੋਂ ਕਰਨ ਨਾਲ ਤੇਜਾਬੀਪਣ ਤੋਂ ਬੱਚਿਆ ਜਾ ਸਕਦਾ ਹੈ। ਬਫਰ ਵਿਚਲੇ ਮਿੱਠੇ ਸੋਡੇ ਅਤੇ ਮੈਗਨੀਸ਼ੀਅਮ ਆਕਸਾਈਡ ਸਦਕਾ ਉਝਰੀ ਅੰਦਰ ਤੇਜਾਬ ਸੀਮਤ ਰਹਿੰਦਾ ਹੈ। ਸਰਦੀਆਂ ਵਿਚ ਯੀਸਟ (ਖ਼ਮੀਰ) ਦੀ ਵਰਤੋਂ ਨਾਲ ਜਿਥੇ ਪਸ਼ੂ ਦੀ ਭੁੱਖ ਵੱਧਦੀ ਹੈ ਉਥੇ ਦੁੱਧ ਦੀ ਫੈਟ'ਚ ਵਾਧਾ ਹੰਦਾ ਹੈ, ਦੁੱਧ ਵੀ ਵੱਧਦਾ ਹੈ। ਯੀਸਟ ਵੀ ਕਈ ਕਿਸਮ ਦੇ ਉਪਲੱਭਦ ਹਨ; ਲਾਈਵ, ਮੈਟਾਬੁਲਾਇਟ, ਇੰਜ਼ਾਇਮ ਆਦਿ। ਸਰਦੀਆਂ ਵਿੱਚ ਹਰਾ ਤਾਂ ਵੱਧ ਹੁੰਦਾ ਹੈ, ਪਰ ਬਹੁਤਾ ਸਮਾਂ ਧੁੰਦ ਸਦਕਾ/ ਸੂਰਜ ਦੇ ਨਾਂ ਚੜਨ ਕਰਕੇ, ਵਿਟਾਮਿਨ ਦੀ ਘਾਟ ਹੋ ਸਕਦੀ ਹੈ ਇਸ ਕਰਕੇ ਜੇ ਵਿਟਾਮਿਨ ਦਾ ਇਸਤੇਮਾਲ ਕੀਤਾ ਜਾਏ ਤਾਂ ਜਾਨਵਰ ਬਿਮਾਰ ਘੱਟ ਹੁੰਦੇ ਹਨ, ਪ੍ਰਜਨਣ ਸੰਬਧੀ ਮੁਸ਼ਕਲਾਂ ਘੱਟਦੀਆਂ ਹਨ।

ਸਰਦੀਆਂ ਵਿੱਚ ਹਰਾ ਅਕਸਰ ਜਰੂਰਤ ਨਾਲੋਂ ਜ਼ਿਆਦਾ ਗਿਲ਼ਾ ਹੁੰਦਾ ਹੈ ਜਿਸ ਕਰਕੇ ਗੋਹਾ ਪਤਲਾ ਆਉਂਦਾ ਹੈ, ਇਸ ਲਈ ਸੁੱਕੀ ਤੂੜੀ ਵੱਧ ਪਾਣੀ ਪੈ ਜਾਂਦੀ ਹੈ। ਪਰ ਵਧੇਰੇ ਤੂੜੀ/ਪਰਾਲੀ ਸੱਦਕਾ ਉਲੀ ਲਗਣ ਦਾ ਖਤਰਾ ਵੀ ਵੱਧ ਹੁੰਦਾ ਹੈ ਇਸ ਕਰਕੇ ਖ਼ੁਰਾਕ ਵਿੱਚ ਟਾਕਸਿਨ ਬਾਂਈਡਰ ਦਾ ਇਸਤੇਮਾਲ ਜਰੂਰ ਕੀਤਾ ਜਾਏ। ਅੱਜਕਲ ਫੀਡ ਜਾਂ ਵੰਡ ਗਿਲੀ ਨਾ ਕਰੋ। ਜੇ ਕਰ ਲਵੇਰਿਆਂ ਦੀ ਸੁੱਕਾ ਮਾਦਾ ਖਾਣ ਦੀ ਪੂਰਤੀ ਹੋ ਰਹੀ ਹੈ ਤਾਂ ਉਸ ਤੇ ਸਰਦੀ ਦਾ ਅਸਰ ਘੱਟ ਹੋਏਗਾ। ਕੋਸ਼ਿਸ਼ ਕਰੋ ਕਿ ਜਿਹੜਾ ਵੀ ਹਰਾ ਚਾਰਾ ਹੈ ਉਸ ਦੇ ਕੁਤਰੇ ਦਾ ਆਕਾਰ ਛੋਟਾ ਹੋਏ ਤਾਂ ਕਿ ਪਸ਼ੂ ਵੱਧ ਖਾਏ।

ਕੁੱਝ ਜਰੂਰੀ ਨੁਕਤੇ:

1. ਜ਼ਿਆਦਾ ਨਮਕ ਦੀ ਮਾਤਰਾ ਕਾਰਣ ਪਿਸ਼ਾਬ ਵਧੇਰੇ ਆਏਗਾ, ਸਰੀਰ ਵਿੱਚ ਪਾਣੀ ਦੀ ਕਮੀ ਹੋ ਸਕਦੀ ਹੈ। ਇਸਲਈ ਸਰਦੀਆਂ ਵਿੱਚ ਨਮਕ ਦੀ ਮਾਤਰਾ ਘਟਾਓ।
2. ਸਰਦੀਆਂ ਵੇਲੇ ਖ਼ੁਰਾਕ ਵਿਚਲੀ ਪ੍ਰੋਟੀਨ ਦੀ ਮਾਤਰਾ ਘੱਟ ਰੱਖੋ, ਸਗੋਂ ਇਸਦੀ ਗੁਣਵੰਤਾ (ਬਾਈਪਾਸ ਪ੍ਰੋਟੀਨ, ਅਮੀਨੋ ਐਸਿਡ) ਦੀ ਮਾਤਰਾ ਵਧਾਓ। ਇਸ ਨਾਲ ਭੋਜਨ ਪ੍ਰਣਾਲੀ ਤੇ ਚੰਗਾ ਅਸਰ ਪਏਗਾ ਤੇ ਸ਼ੈਡ ਅੰਦਰ ਅਮੋਨੀਆ ਗੈਸ ਘੱਟ ਬਣੇਗੀ ।
3. ਸਰਦੀਆਂ ਵਿੱਚ ਵੱਧ ਪ੍ਰੋਟੀਨ ਸਦਕਾ ਗੋਹਾ ਪਤਲਾ ਹੋ ਸਕਦਾ ਹੈ। ਇਸ ਕਰਕੇ ਵੰਡ ਵਿੱਚ ਰੇਸ਼ੇ ਦੀ ਮਾਤਰਾ 1-2% ਵੱਧ ਰਖੋ।
4. ਫਲੀਦਾਰ ਚਾਰੇ ਕੈਲਸ਼ੀਅਮ ਭਰਭੂਰ ਹੁੰਦੇ ਹਨ, ਇਸ ਲਈ ਵੰਡ ਵਿੱਚ ਡੀ.ਸੀ.ਪੀ. ਦੀ ਮਾਤਰਾ ਵਧਾਓ ਜਾਂ ਕੈਲਸ਼ੀਅਮ ਦੀ ਮਿਕਦਾਰ ਘੱਟ ਕਰੋ।
5. ਸਰਦੀਆਂ ਵਿੱਚ ਮੋਸਮੀ ਦਬਾਅ ਕਾਰਣ ਲਵੇਰੇ ਤਨਾਅ ਵਿੱਚ ਆ ਸਕਦੇ ਹਨ ਜਿਸ ਨਾਲ ਉਨਾਂ ਦੀ ਬਿਮਾਰੀਆਂ ਨਾਲ ਲੜਨ ਦੀ ਸਮਰਥਾ ਘੱਟਦੀ ਹੈ। ਇਸ ਲਈ ਵੰਡ ਵਿੱਚ ਖਾਸ ਸੂਖਮ ਪਦਾਰਥ ਵਰਤੋ ਤਾਂ ਕਿ ਲਵੇਰਿਆਂ ਦੀ ਅੰਦਰੂਨੀ ਤਾਕਤ ਵਧੇ।

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अधिक दुग्ध उत्पादन के लिए स्वस्थ दुधारू पशुओं का चयन

डॉ. मनीषा सिंगोदिया
स्नातकोत्तर पशुचिकित्सा शिक्षा एवं अनुसंधान संस्थान (पी.जी.आई.वी.ई.आर.), जयपुर

डेरी फार्म की सफलता उत्तम नस्ल के पशुओं पर निर्भर करती है। दुग्ध उत्पादन हेतु दुधारू पशु खरीद/क्रय करते समय उसके चयन में सावधानी रखना आवश्यक होता है। अच्छी नस्ल के पशु का चयन करने से दूध उत्पादन पर्याप्त मात्रा में मिलता है, जिससे किसान को आर्थिक लाभ होता है। हमारे देश में साहीवाल, लाल सिन्धी, थारपारकर, गिर तथा हरियाणा आदि गायों तथा मुर्रा, नीलीरावी, भदावरी, मेहसाना तथा सूरती आदि भैंसों की उत्तम नस्लें हैं। वांछित आनुवंशिक क्षमता वाले पशुओं की पहचान करना तथा केवल शारीरिक बनावट के आधार पर पशुओं की पहचान करना चुनौती है। यदि दुधारू पशु का चयन एवं पालन–पोषण ठीक प्रकार से किया जाये तो इनकी उत्पादन क्षमता को 15–20 प्रतिशत तक बढ़ाया जा सकता है।

दूध उत्पादन हेतु पशु खरीदने से पहले, इनके बारे में निम्न आधार पर पता लगाएं–

- बाह्य आकृति के आधार पर
- संतान उत्पादन के आधार पर (संतति परीक्षण)
- जानवर का पूरा इतिहास (वंशावली) के आधार पर

बाह्य आकृति के आधार पर

पशुओं के द्वारा प्रदर्शित लक्षणों के आधार पर उनका चयन करना आसान है – जैसे कि दूध उत्पादन के लिए गायों/भैंसों का चयन करना। आकर्षक शारीरिक संरचना और सभी भागों के सामंजस्यपूर्ण सम्मिश्रण, प्रभावशाली शैली और संचरण। हाट या मेले में जहां पशुओं की जानकारी उपलब्ध नहीं होती है, वहाँ पर दुधारू पशुओं का चुनाव, उनकी बाह्य आकृति के अनुसार किया जाता है। इसमें कुछ प्रमुख बिन्दुओं पर ध्यान देना चाहिये–

प्रारूप अथवा शारीरिक बनावट

भाारीरिक बनावट कई अच्छे लक्षणों का प्रतिबिम्ब होती है और प्रारूप के आधार पर चयन काफी पुरानी विधि है। दुधारू गाय की पहचान उसकी त्रिभुजाकार शारीरिक बनावट से की जा सकती है। ऐसी दुधारू गाय का पिछला भाग आकार में बड़ा और भारी, परन्तु अग्रमि भाग अपेक्षाकृत पतला और छोटा होता है। दुधारू गाय की त्वचा पतली, ढीली, चिकनी और मुलायम होती है। बाल नरम व चमकीले होने चाहिए व चर्बी अधिक नहीं होनी चाहिए। इसकी आँखें उज्ज्वल, गर्दन दुबली और त्वचा चमकदार होनी चाहिए। इसकी पूंछ सीधी, पतली, मजबूत और रोएंदार होनी चाहिए। विस्तृत, अच्छी तरह से उभरी पसलियों के साथ एक गहरे, लंबे शरीर वाली गाय को एक बड़ी शारीरिक क्षमता वाली कहा जाता है।

अयन एवं थन का आकार रू गाय का थन 5–6 से.मी. लम्बा और 20–25 मि.मी. व्यास का हो। वह गाय अच्छी समझी जाती है। समतल भूमि में खड़ी एक दुधारू गाय के थनों और जमीन के बीच 45–50 से.मी. या अधिक से अधिक 48 से.मी. की दूरी आदर्श मानी जाती है। अयन को स्पर्श करने पर वह मुलायम प्रतीत होता है, जिसकी दुग्ध शिराएं विशेष रूप से विकसित होती हैं। गाय अथवा भैंस के अयन चार थनों में विभाजित रहते हैं। सभी थन एक समान, सीधे और सामान दूरी पर होने चाहिए चारों थनों में सामान मात्रा में दूध आना चाहिए और दूध की धार मोटी होना चाहिए। झूलते हुए अयन अच्छे नहीं माने जाते हैं, क्योंकि जब गाय व भैंस चरने हेतु छोड़ी जाती हैं तो कांटे या नुकीले पदार्थ से थन को जख्म होने की संभावना रहती है और थनैला रोग की समस्या बढ़ जाती है।

मुख – जबड़ा चौड़ा और मजबूत होना चाहिए, जिससे कि गाय को जुगाली करने में आसानी हो। नथुने चौड़े, बड़े व गीले होने चाहिए।

गर्दन – गर्दन लंबी एवं पतली होनी चाहिए। गर्दन की चमड़ी नर्म व लोचदार होनी चाहिए। उंगली के खींचते ही हाथ में आना व छोड़ने पर पुनः उसी जगह पर चले जाना स्वस्थ पशु के लक्षण होते हैं।

पीठ – पीठ लंबी एवं सीधी होनी चाहिए। पीठ के पीछे का हिस्सा चौड़ा होना चाहिए। गाय की लंबाई अच्छी होनी चाहिए, जिससे फेफेड़े, पेट एवं गर्भाशय अच्छी तरह विकसित हो सकें।

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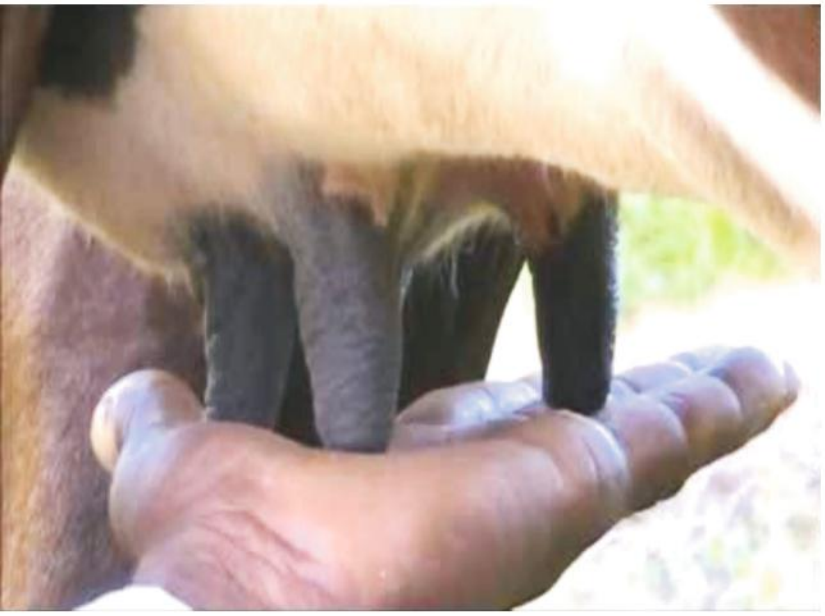


पृष्ठभाग – सीधे पुठ्ठों या पीछे के पुठ्ठों वाली गायों की उपेक्षा की जा सकती है (सीधे पुठ्ठे या पीछे के पुठ्ठे जानवर की एक विकृति है जो भार सहन नहीं कर सकते और समान रूप से आदर्श प्रजनन या दुग्धपान कराने के लिए इनकी सिफारिश नहीं की जाती है)। एक संकीर्ण साइन वाली गाय सामान्य रूप से अच्छा दूध नहीं देती है। विक्रेता के सामने ही गाय को दोहना चाहिए जिसमें निम्न बिंदुओं को भी ध्यान में रखा जाना चाहिये–

- दूध देते समय गाय लात तो नहीं मारती है। गाय बछड़े के बगैर भी दूध देती है। दूध सभी थनों में से निकल रहा है या नहीं। दूध देने में आसानी है या कठिनाई होती है।
- 3 से 4 चार साल की उम्र के पशु का चयन करें । जो की अच्छा दूध उपज के साथ विनम्र स्वभाव का हो, दुग्ध उत्पादन 1–2 ब्यांत के बाद बढ़ता चला जाता है अतः 1–2 बयातों बाद ही पशु लें।
- कोई भी जानवर अक्टूबर व नवंबर माह में खरीदा जाना सही माना जाता है।

संतान के उत्पादन के आधार पर

पशुओं का चुनाव उनकी संतान के उत्पादन के आधार पर किया जाना अधिक लाभकारी होता है। इन संतान में माता–पिता दोनों के गुण सम्मिलित रहते हैं, अतरू जिन पशुओं की संतान की उत्पादन क्षमता अधिक रहती है, उन्हीं के आधार पर चयन किया जा सकता है। दो ब्यातों का अन्तराल करीबन 15 माह होना चाहिए ब्याने के तीन माह पश्चात ही गाय का पुनरू गर्भधारण कर लेना अच्छा माना जाता है। पशुओं के आहार एवं वातावरण पर पशुधन की उत्पादकता एवं पशुओं की गुणवत्ता निर्भर करती है।

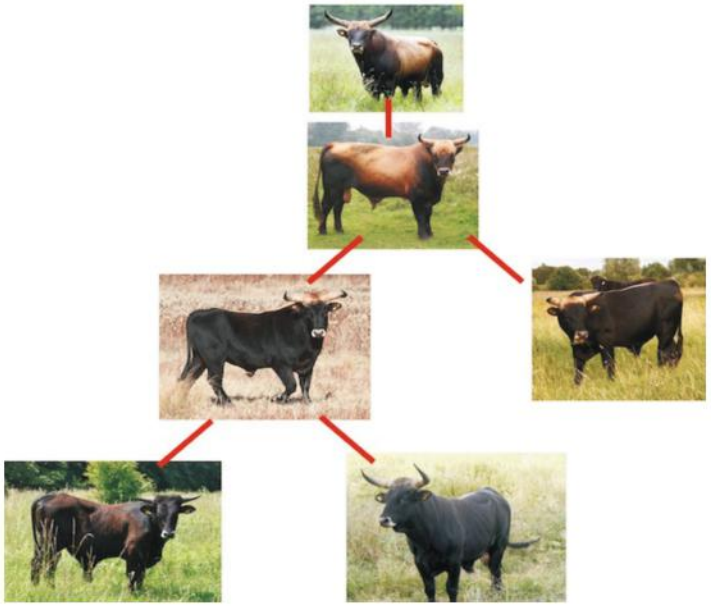
वंशावली के आधार पर

प्रत्येक नस्ल के शारीरिक विकास उनकी वंशावली के आधार पर होता है। माता–पिता से गुण बच्चों में जाते हैं, अतरू दुधारू पशु के बच्चे भी अधिक दूध देने की क्षमता रखते हैं, बशर्ते उन्हें अच्छा आहार तथा उनके अनुरूप वातावरण प्राप्त हो। इसलिए किसी भी पशु की इतिहास और वंशावली देखी जानी चाहिये क्योंकि अच्छे कृषि फार्मों द्वारा ये हिसाब रखा जाता है। हालांकि, उन लक्षणों को, जिन्हें पशु स्वयं प्रदर्शित नहीं करते जैसे सांड की दूध उत्पादन क्षमता, के आधार पर सांड़ों का चयन करना कठिन है। इस प्रकार सांड़ों का चयन, उनके संबंधियों (माता, बहन या पुत्री) के लक्षण के आधार पर किया जाता है। आर्थिक पहलू से गाय एवं भैंसों के गुणों को तीन क्रमों में बांटा गया है– (1) शारीरिक विकास, (2) दूध उत्पादन और (3) प्रजनन। दुधारू पशुओं की पहचान नस्ल के आधार पर अधिकांशतरू की जाती है। प्रत्येक नस्ल के शारीरिक विकास उनकी वंशावली के आधार पर होता है। सांड को दुग्ध प्रक्षेत्र का आधा हिस्सा माना जाता है, क्योंकि एक सांड से बहुत से बच्चे पैदा हो सकते हैं। अतरू सांड को प्रजनन हेतु लाने के समय ठीक से चयन करना बहुत आवश्यक है।

पशु की जाँच

- अगर गर्भवती पशु को खरीदा जा रहा है, तो एक पशु चिकित्सक द्वारा गर्भावस्था की जाँच की जानी चाहिए।
- पशु खरीदने से पहले टीबी, जेडी और ब्रुसिला की जाँच की जानी चाहिए।
- टीकाकरण और स्वच्छता रिकॉर्ड को सत्यापित किया जाना चाहिए।

डेरी किसानों तथा उद्यमियों को सुझाव दिया जाता है, कि दुधारू पशु का चुनाव करते समय उनकी शारीरिक बनावट, नस्ल, उत्पादन क्षमता, उम्र इत्यादि बिन्दुओं पर विशेषरूप से ध्यान दिया जाना चाहिए। इसके अतिरिक्त यह भी देखना चाहिए कि पशु पूर्णरूप से रोगमुक्त हो जहाँ तक संभव हो, गर्भवती गाय, भैंसों का चुनाव उचित रहता है।



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Pseudogene's Silent Whispers:
Shaping Gene Silencing Landscapes Through Regulatory Crosstalk

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Abstract

Pseudogenes, classically regarded as non-functional vestiges of gene evolution, have been redefined as integral components in gene regulation, particularly gene silencing processes. Their contributions encompass diverse mechanisms that intricately modulate cellular transcriptomic dynamics. Pseudogene-generated endogenous siRNAs can participate in RNA interference cascades, instigating targeted gene down regulation. Intriguingly, pseudogenes exhibit context-dependent expression patterns, suggesting nuanced regulatory roles across tissues and developmental stages. Recent findings also propose scaffold functions, facilitating protein complexes implicated in chromatin remodeling and epigenetic modulation. The conventional view of pseudogenes as genomic fossils has yielded to a paradigm in which they intricately contribute to gene silencing networks. This expanding understanding underscores their significance in the intricate tapestry of cellular governance.

Introduction

Pseudogenes are widespread and plentiful within genomes. In the past, they were labeled as "genomic fossils" and dismissed as "junk DNA" for a considerable period. However, it is now acknowledged that certain pseudogenes fulfill crucial functions in regulating their parent genes. Furthermore, numerous pseudogenes undergo transcription into RNA. These transcribed pseudogenes might also give rise to small interfering RNAs or lead to a reduction in cellular miRNA concentration. Modern molecular biology is undergoing a transformative shift in perspective as it becomes clear that the extensive quantities of so-called "junk" DNA, once considered remnants of evolution, might indeed possess functionality. Recent research provides compelling evidence for the functional role of non-coding RNAs derived from pseudogenes, which were previously disregarded. These pseudogene-expressed non-coding RNAs play a regulatory role in relation to their protein-coding counterparts. A multitude of pseudogenes-numbering in the hundreds-have been observed to undergo transcription into RNA across a diverse array of tissues and tumors. While much attention has been given to pseudogenes expressed in the sense direction, there are indications from certain reports that pseudogenes can also be transcribed as antisense RNAs (asRNAs).

Transcripts originating from pseudogenes have been identified as influencers of ancestral protein-coding gene expression through molecular mechanisms grounded in RNA sequence similarity. These pseudogene-derived transcripts have been shown to control the ancestral gene's expression through various means: generating endogenous siRNAs, acting as competitive endogenous RNAs (ceRNAs) by sequestering miRNAs, or modifying the stability of the ancestral mRNA. Furthermore, the transcripts of antisense pseudogenes possess the capacity to affect the promoter activity of ancestral genes.

Gene silenced by epigenetic phenomena

Gene silencing via epigenetic mechanisms involving pseudogenes represents a fascinating aspect of molecular biology. Epigenetic regulation refers to modifications that affect gene expression without altering the DNA sequence itself. Pseudogenes, once considered inert "junk" DNA, have emerged as key players in this process. Epigenetic gene silencing mediated by pseudogenes typically involves the creation of small non-coding RNAs or long non-coding RNAs (lncRNAs). These RNA molecules can interact with chromatin-modifying complexes and guide them to specific genomic regions. The result is the modification of histones and DNA methylation patterns, leading to alterations in the chromatin structure and transcriptional activity of nearby genes.

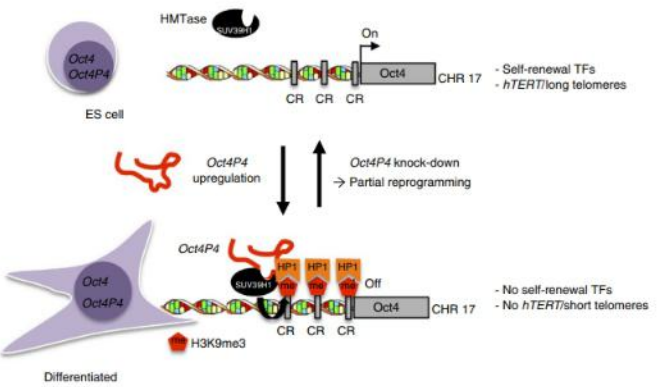

Figure 1. Oct4 gene expression regulation by pseudogene Oct4p4

Anti-sense pseudogene transcripts can impact on the promoter activity of ancestral genes. Scarola et al. (2015) used mESCs (mouse embryonic stem cells) to identify a set of novel transcripts derived from putative Oct4 pseudogenes (Oct4P1, Oct4P2, Oct4P3 Oct4P4 and Oct4P5). Tight regulation of subcellular localization and expression during mESC differentiation anticipate a defined role for a subset of these transcripts in mESC biology. Here, their studies focused on a nuclear-restricted non-coding RNA (ncRNA) that is transcribed in sense orientation from the processed, X-linked Oct4P4. Dramatic upregulation of sense Oct4P4 transcription during mESC differentiation gives rise to a long, non-coding RNA that forms a complex with the repressive H3K9-specific HMTase(Histone methyl transferase) SUV39H1. This complex translocates to the promoter of the ancestral Oct4 protein-coding gene, located on chromosome 17, to impose H3K9 tri-methylation leading to a consecutive recruitment of HP1a and silencing of the ancestral Oct4 gene (Fig. 1). Interfering with the murine Oct4P4-SUV39H1 silencing complex in differentiated cells leads to the re-activation of mESC self-renewal transcription factor expression and telomerase-dependent telomere maintenance mechanism (Fig.1)

Gene silencing by siRNA

Pseudogenes populate the mammalian genome as remnants of artefactual incorporation of coding messenger RNAs into transposon pathways. Tam et al. (2015) show that a subset of pseudogenes generates endogenous small interfering RNAs (endo-siRNAs) in mouse oocytes. These endo-siRNAs are often processed from double-stranded RNAs formed by hybridization of spliced transcripts from protein-coding genes to antisense transcripts from homologous pseudogenes.

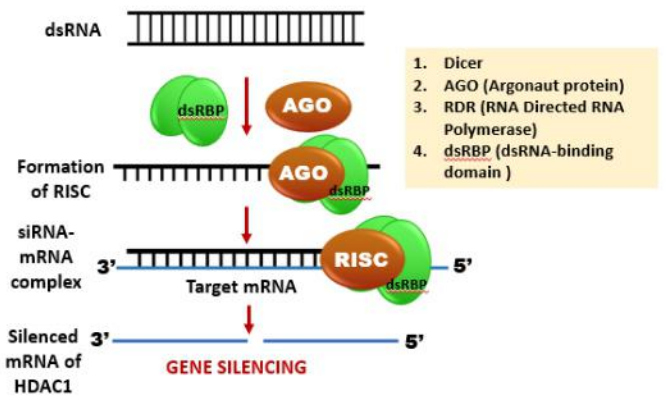

Figure 2. Hdac1 gene expression regulation by pseudogene by siRNA

They showed that mammalian oocytes, protein-coding mRNAs interact with pseudogene transcripts to form dsRNAs that are processed into endo-siRNAs. Examination of Dicer knockouts indicates a function for endo-siRNAs in gene regulation. The specific case of HDAC1 may point to a RNA-induced silencing complex (RISC)-based mechanism. Few uniquely mapping siRNAs are generated from the Hdac1 gene itself, suggesting that it is not used prominently as a Dicer substrate. Instead, most uniquely mapping sense and antisense siRNAs can be assigned to a series of Hdac1 pseudogenes. On the basis of its increased expression in Dicer-null oocytes, they propose that pseudogene-derived, antisense siRNAs direct RISC to cleave Hdac1 mRNAs.

Conclusion

Given the vast repertoire of vertebrate pseudogenes, we anticipate the existence of a series of pseudogene-derived lncRNAs that use mechanisms analogous to Oct4P4 to control the expression of ancestral genes on the epigenetic level. Understanding pseudogene lncRNA-dependent mechanism of epigenetic gene regulation and a precise categorization of pseudogene-derived lncRNAs based on subcellular localization, gene expression regulation and deposition at gene promoters will provide important insights into the global role of pseudogene derived lncRNAs in regulating higher order chromatin structure. On the flip side, the absence of a pseudogene transcript might find remedy through the introduction of an external expression mechanism. This could be achieved by employing a viral vector in a traditional gene therapy strategy. A prime illustration lies in the scenario of PTENP1 depletion within melanoma. In this context, introducing an excess of PTENP1 transgene could potentially reinstate the functionality of a tumor-suppressor and decelerate the progression of the tumor.

Future perspectives

For some genes, the loss of coding potential and pseudogenization leads to gene death, and ultimately removal from the genome. For others, inactive genes are resurrected as noncoding RNA genes and neo-functionalized as gene-regulatory elements. Pseudogene-derived transcripts can regulate gene expression by generating small RNAs, regulating mRNA stability via direct binding or sequestration of trans-acting RNA decay proteins, sponging of endogenous miRNAs and promoter recruitment of epigenetic remodeling complexes. The extent to which pseudogenes are important in gene regulation and the pathogenesis of disease has so far been underappreciated for a number of reasons. First, only a relatively small number of functional pseudogenes have been extensively characterized. Second, functional pseudogenes exert their effects on gene expression via a plethora of mechanisms that are not always easily inferred by analysis of the primary nucleic acid sequence. Third, working with pseudogenes presents technical difficulties due to the close homology between the pseudo-and parental-mRNA sequences. Finally, the lineage specificity of pseudogenes and particularly the lack of conservation between humans and mice may prove to be an obstacle in the development of pseudogene-targeted therapeutics. Nevertheless, pseudogene-transcribed lncRNAs are emerging as both important regulators of gene expression and as promising novel targets for pharmacological intervention.

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ARTICLE

Control, Counteraction and Amelioration of Aflatoxin Problem in Animals

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Summary

Mycotoxins are fungal secondary metabolites present in animal feeds and human food stuffs. The extent of fungal contamination depends on environmental factors like excess moisture, hot and humid climate and insect damage. Most common mycotoxins of significance are aflatoxin, ochratoxin and fusarial toxins(Fumonisins, Zearalenone, Trichothecenes). Aflatoxins produced by Aspergillus fungi affect all categories of livestock and poultry being more susceptible. They are hepatocarcinogenic and on cumulative consumption cause poor performance and reduced immunity. Aflatoxins are mutagenic and carcinogenic in nature. Hence suitable preventive and counteractive measures need to be undertaken. Suggested measures include storing feeds at low moisture level and use of fungicides (organic acids, urea, ammonia) is effective to arrest fungal growth. Use of non-toxigenic strains of fungi as biocompitator to control the growth of toxigenic fungi is found effective. Some anti-fungal metabolites (cyclic dipeptides, caproic acid, lactic acid, fungicin) produced by bacteria have been proved effective. Genetic modification of mold susceptible plants for increased production of anti-fungal proteins and phenolics also reduces the fungal colonization. Dry heating and sun drying of aflatoxin contaminated feed degrade the toxin. Silicated binders and charcoal are effective in counteracting the aflatoxins. Chemicals like sodium bisulphite, ammonia and sodium hypochlorite are effective in breaking the cyclic structure of aflatoxins. Yeast and lactic acid bacteria are known to bind aflatoxins, rendering them unavailable for gut absorption. Certain microbes degrade aflatoxins and biotransform them to less toxic metabolites. Nutritional strategies like supplementation of hepatotrophic nutrients, methionine, vegetable oil and antioxidants like BHT, BHE, Vitamin E, Selenium and curucumin are also known to reduce the toxic effects of aflatoxins. Of late, there is a greater interest in use of microarray technique for early forecasting of fungal contamination of feeds and understanding the mechanism of aflatoxicosis at cellular level. This would help in evolving better strategies for aflatoxin prevention and counteraction.

Introduction

Mycotoxins are the toxic products of fungal metabolism occur in a wide variety of commodities like animal feeds and human food products. Mycotoxins on ingestion can cause health hazards both in livestock and human beings and hence there is a greater economic implication. The severity of mycotoxin contamination is determined by major environmental factors like excessive moisture in the field and in storage, hot and humid climate and insect infestation. Mycotoxin contamination of feed affect dairy cattle, poultry, sheep swine and reduces growth efficiency, impairs resistance to infection and reproduction. Economic losses due to mycotoxicosis are derived directly from livestock morbidity and mortality and wastage of contaminated feed. On a global scale, it is estimated that around 25% of the world's crops are affected by mycotoxins annually and this has a direct bearing on economy due to loss of feed, reduced animal productivity and costs involved in monitoring the level of mycotoxins. The mycotoxins that are of significance in animal feed are : Aflatoxin, Ochratoxin and Fusarial toxins (Fumonisin, Zearalenone, Trichothecenes, Deoxynivalenol).

Aflatoxins and biological action

The aflatoxins are highly toxic and carcinogenic compounds produced by Aspergillus fungi at an optimum temperature of 25-320 C, moisture of greater than 12-16% and a relative humidity of 85%. Commonly affected feeds are maize, groundnut cake, cottonseed cake and copra cake and causes toxicity in poultry, cattle, sheep and swine. Animal consuming aflatoxin contaminated feed display poor performance, reduced immunity, liver damage, kidney and intestinal haemorrhage and liver tumor. Among the afltoxins B1 is more prevalent and toxigenic. This is metabolized to Aflatoxin M1 in liver and is excreted in milk of dairy cattle and also as residue in egg / meat. Epoxide derivative of aflatoxin B1 binds with DNA and disrupts transcription and translation activities, thus initiating carcinogenesis. Oxidative nature of the toxic derivative releases free radicals and cause cell damage (Fig.1). Advancement in molecular techniques like microarray and PCR has helped to understand the precise mechanism of action of aflatoxin. Recent gene expression studies have shown that down regulation of mitochondrial carnitine palmitoyltransferase (CPT) system, down regulation of fatty acid metabolism pathway, up-regulation of cell proliferation pathway and down regulation of B cell activation are respectively responsible for decreased body weight gain, fatty liver / increased liver weight, carcinoma and lowered immunity in birds fed aflatoxin. Supplementation of curcumin through turmeric powder ameliorated most of the ill effects induced by aflatoxin. Adverse effects of aflatoxicosis are much severe when there is a concurrent contamination with other toxins like aflatoxin,ochratoxin and T-2 toxin.

Limits of aflatoxin

The presence of Aflatoxin M1 in food products meant for human consumption is not desirable and the residual concentration should not exceed 0.5 ppb. Aflatoxin B1 level of 20 ppb in the diet of dairy cattle is appropriate for reducing the risk of aflatoxin M1 in milk. In many countries there are strict guidelines for maximum tolerable limits of aflatoxins, beyond which the commodity is unsafe and not accepted (Table 1).

Table 1. Suggested limits for aflatoxin.

Particular	US FDA	EU (Very stringent)	BIS/FSSAI India
Compound feed AFB1	20	5	20
Milk, AFM1	0.5	0.05	0.50
Cereal grains AFB1	20	20	50
Oilseeds and meal	20	20	50

Control and Counteraction of Aflatoxins

Preventive Measures

Aflatoxins affect mainly liver and kidney and are also carcinogenic and mutagenic. Therefore effective control and detoxification measures need to be undertaken.

Toxin producing fungi may invade at pre-harvesting period, harvest-time, during post harvest handling and in storage. According to the site and time of infestation, the fungi can be divided into three group:

(a) Field fungi (b) Storage fungi (c) Advanced deterioration fungi. Field fungi are generally plant pathogenic fungi; namely Fusarium. The storage fungi are Aspergillus and Penicillium. The advanced deterioration fungi, normally do not infest intact grains but easily attack damaged grains and requires high moisture content, that include Aspergillus clavatus, Aspergillus fumigatus. Prevention and effective plan for reducing fungal growth and toxin production is very important. The recommended practices include 1. Development of fungal resistant varieties of plants, 2. Suitable pre-harvest, harvest and post harvest techniques, 3. Store commodities at low temperature as for as possible 4. Use fungicides and preservatives against fungal growth and 5. Control of insect damage in grain storage with approved insecticides.

The secondary prevention of fungal growth include limiting the growth of infested fungi by re-drying the product, removal of contaminated seeds and inactivation of mycotoxins produced. The tertiary measures could be to prevent the transfer of fungi and their health hazardous toxins into the food/feed and to the environment. This include complete destruction of the contaminated product or diversion for fermentation to produce ethanol or detoxification / destruction of mycotoxins to the minimum level. Among the mycotoxins, aflatoxin is the most well-known and thoroughly studied and its prevention and control has been most successfully practiced in many countries.

I. Fungal growth inhibition

The inhibition of fungal growth can be achieved by physical, chemical and biological treatments. After the crop is harvested, drying and proper storage and suitable transportation of the commodities are of prime importance. Factors contribute to the growth of fungi and toxin production include high moisture content, humid climate, warm temperature (25-40 C), insect infestation and grain damage.

Physical Methods

- Drying seeds and commodities to the safe moisture level (< 9-11%).
- Maintenance of the container or store house at low temperature and humidity.
- Keep out insects and pests from the storage.
- Gamma-irradiation of large-scale commodities.
- Dilution of the contaminated feed with safe feed.

Chemical Methods

- Use of fungicides (acetic acid, propionic acid, benzoic acid, citric acid and their sodium salts, copper sulfate): 0.2-0.4 % in feed.
- Use of fumigants - ammonia: 0.2-0.4%
- Addition of herbal extracts (garlic, onion, clove oil, turmeric powder, thyme) : 0.25- 0.5%

Biological Methods

Anti-fungal enzymes, chitinase and -1,3 glucanase found in plant seeds may act as defense against pathogenic fungi, since chitin and glucan are major polymeric components of many fungal cell walls. Such polysaccharides in fungal cell wall could be enzymatically hydrolysed into smaller products resulting in killing of mycelia or spore of fungi. It is foreseen that seeds rich in such anti-fungal enzymes likely to resist the infestation of fungi. Use of non-toxigenic biocompetitive Aspergillus strains to out-compete the toxigenic isolates has been found effective in reducing pre harvest contamination with aflatoxin in peanut and cotton, however, the aflatoxin contamination process is so compelx that a combination of approaches will be required to eliminate toxin production. Application of non-toxigenic strains of Aspergillus flavus and Aspergillus parasiticus to soil in maize plots, favoured the reduction in colonization of toxigenic fungi in subsequent years, when the weather conditions were suitable for fungal growth and resulted in 65-80% decline in aflatoxin production as compared to control. Inoculation of chitosan, Bacillus subtilis and Trichoderma harzianum to pre harvest maize along with Aspergillus flavus inhibits aflatoxin production. Many anti-fungal metabolites (cyclic dipeptides, phenylactic acid, caproic acid, reuterin, lactic acid, acetic acid, fungicin) have been isolated from different cultures of lactic acid bacteria. Aflastin A, an anti-microbial compound produced by Streptomyces Spp,. MRI 142 strain of bacteria is known to inhibit aflatoxin production by Aspergillus parasiticus. Iturin, an anti-fungal peptide produced by Bacillus subtilis had inhibitory effect an Aspergillus parasiticus.

Plant Breeding, Genetic Engineering and Microarray

Genetic modification of mold susceptible plants holds some promise in ensuring food safety. This involves increasing production of compounds like anti-fungal proteins, hydroxamic acids, phenolics that reduce fungal contamination. This may be accomplished by introducing a novel gene to express the target compound, or enhancing the expression of such compounds by the existing genes, thereby capitalizing on the plant's own defense mechanisms. Enzymes that catalyze production of anti-fungals could be targeted for their expression and such an approach is being actively pursued by researchers. Enhanced expression of an -amylase inhibitor in Aspergillus could result in reduced aflatoxin synthesis. Hybrid varieties of cereals with Bt (Bacillus thermophilus) genes have shown reduced aflatoxin production, probably due to higher resistance of plants against pest and insects.

A cluster of genes are responsible for aflatoxin production through pathway-specific transcriptional regulator. A total of 20 genes in the aflatoxin biosynthetic cluster and 3 additional genes outside the aflatoxin biosynthetic cluster responsible for aflatoxin production have been identified. Identification of critical genes governing aflatoxin formation could lead to use of non- aflatoxigenic bio-competitive strains of Aspergillus flavus through use of gene disruption techniques. The advances in molecular biology could aid in early detection of mycotoxin production in food/feed material. DNA-chip with microarray system containing oligonucleotide primers that are homologues to genes of several fungal species responsible for the expression of mycotoxins can be employed to forecast the mycotoxin production in advance and accordingly critical anti-fungal strategies can be employed. Such PCR based molecular techniques are of value in assessing the potential for mycotoxin production. The time gap between expression of a set of genes and actual mycotoxin production is about 4-5 days. This early forecasting of extent of mycotoxin production will help in adopting immediate preventive anti-fungal measures.

II. Counteraction/Detoxification of aflatoxins

Aflatoxins in foods and feeds can be removed, inactivated or detoxified by physical, chemical and biological means. The treated products should be health safe from the chemicals and their essential nutritive value should not be deteriorated.

Physical Methods

Physically, aflatoxin contaminated seeds can be removed by hand picking or photoelectric detecting machines, but this is labor oriented and expensive. Heating and cooking under pressure can destroy nearly 70% aflatoxin. Dry roasting can reduce about 50-70% of aflatoxin and sunlight drying of aflatoxin contaminated feed could reduce the toxin level by more than 70%. The addition of binding agents able to fix mycotoxins may reduce the bioavailability of these compounds in animals, and limit the presence of toxin residues in animal products. In case of aflatoxin B1 (AFB1), hydrated sodium calcium aluminosilicates (HSCAS) and phyllosilicates derived from natural zeolites have a high affinity, both in vitro and in vivo. Zeolites, which are hydrated aluminosilicates of alkaline cations are able to adsorb AFB1. Bentonites have been shown to be effective for the adsorption of AFB1. Other clays, such as kaolin, sepiolite and montmorillonite, bind AFB1 but less effectively than HSCAS and bentonite. Activated charcoal is also effective against AFB1. Combination of yeast, zeolite and activated charcoal is found effective in reducing the toxicity of aflatoxin B1. The limitation of using binders is the reduction in bioavailability of certain trace minerals and vitamins in the diet. Some of these binders are not biodegradable and could pose environmental problem.

Chemical Methods

A variety of chemical agents such as acids, bases (ammonia, caustic soda), oxidants (hydrogen peroxide, ozone, sodium hypochlorite), reducing agents (Bisulphites), chlorinated agents and formaldehyde have been used to degrade mycotoxins in contaminated feeds particularly aflatoxins. However, these techniques are not totally safe, are expensive and not well accepted by consumers.

Biological/Microbiological Methods

The biological decontamination of mycotoxins using yeast Saccharomyces cerevisiae and lactic acid bacteria has received much attention. Yeast and lactic acid bacterial cells are known to bind different toxins on the cell wall surface. This will be of immense value in reducing the mycotoxin hazards (Table 2), and effective binding strains of these microbes could eventually be used to minimize aflatoxin exposure and improving overall health in animals. Esterified glucomannan obtained from the cell wall of yeast Saccharomyces cerevisiae are able to bind AFB1 and provide protection against aflatoxins. About 500 gm of glucomannans from yeast cell- wall have the same adsorption capacity as 8 kg of clay. This binder reduces the AFM1 content of milk by 58% in cows given a diet contaminated with AFB1 at a concentration of 0.05% of dry mater. Probiotic strain of Lactobacillus acidophilus CU028 has shown to bind aflatoxin. Probiotic fermented milk containing Lactobacillus casei and Lactobacillus rhamnosus strains alone or in combination with chlorophyllin exhibited protective effect against aflatoxin B1-induced hepatic damage. Acid treated lactic acid bacteria were able to bind high dosage of aflatoxin in gut conditions.

Biotransformation

Dual cultivation of Aspergillus niger, Mucor racemosus, Alternaria alternata, Rhizopus oryzae and Bacillus stearothermophilus with toxigenic strain of Aspergillus flavus results in 70- 80% degradation of aflatoxins. Certain microbes are also able to metabolize mycotoxins (Corynebacterium rubrum) in contaminated feed or to biotransform them(Rhizopius, Trichosporon mycotoxinivorans, Rhodotorula rubra, Geotrichum fermentans). However, these biological processes are generally slow and have a varied efficiency. Ruminants are considered to be relatively resistant to aflatoxins, due to biodegrading and biotransforming ability of rumen microbes compared to monogastric animals. This would be a great asset in biological detoxification of aflatoxins and with the help genetic engineering techniques, benefits of this can be better realized.

Table 2. Aflatoxin binding ability of different strains of yeast and bacteria

Isolates	Number of aflatoxin B1 binding strains Percentage of binding			
	<15	15-39	40-59	>60
Yeast				
Saccharomyces cerevisiae	1	8	3	3
Condida krusei	4	5	1	1
Candida parapsilosis				
Trichosporon mucoides	1	-	-	-
Candida catenulanta	1	-	-	-
Bacteria				
Lactobacillus plantarum	-	-	4	1
Lactobacillus fermentum	-	-	-	1
Pediococcus acidilactici	-	-	1	-

III. Dietary manipulations

Hepatotropic Nutrients and Anti-oxidants

Various nutritional strategies have been employed to alleviate the adverse effects of aflatoxins. Addition of specific amino acids like methionine in excess of their requirement protect the chicks from growth depressing effects of AFB1, possibly through an increased rate of detoxification by glutathione, a sulfur amino acid metabolite. Supplementation of phenyl alanine has shown to alleviate toxicity of ochratoxin. Addition of vegetable oil (safflower oil, olive oil) to aflatoxin contaminated feed improves the performance of chicks. Aflatoxins cause toxicity through release of free radicals and lipid peroxidation. Hence, antioxidants could aid in the overall detoxification process in liver and hence may help in alleviation of aflatoxicosis. Butylated hydroxy toluene (BHT) is effective in preventing the adverse effects of AFB1. Vitamin E and Selenium supplementation also has shown to overcome negative effects of afla toxin. Of late, there is a growing interest in the use of phytochemicals (curcumin, flavonoids, resveratrol, Allixin, polyphenolics) as antioxidants in increasing the activity of antioxidant enzymes (SOD, catalase, glutathione peroxidase) and neutralizing the free radicals, thus, ameliorating the mycotoxin toxicity.

Conclusion

Aflatoxins are common in nature, hence minimizing the contamination is not a easy task due to the interaction of fungus with environment and feed material. This involves constant attention during the entire process of grain harvest, storage, feed manufacturing and animal production. Most effective methods (physical, chemical, biological, biotechnological) to improve seed production, cultivation, harvest and storage need to be adopted. Use of binders and understanding their mechanism of action is the current concept and research areas in use of microbes for decontamination and biotransformation of aflatoxins is gaining momentum. Biotechnological intervention in terms of developing transgenic fungal resistant crops and biological control using non-toxigenic, competitive fungal species holds a better promise in managing the problem of aflatoxicosis. Advancement in molecular techniques using fungal oligonucleotide probes with PCR based microarray analysis would help in early forecasting / detection of potential aflatoxin production, suggesting for critical control strategies.

NOVUS

NOVUS to Deliver Milk Production Advice to India Market in Webinar Series

Achieving the maximum output of milk yield and components is the goal of any dairy farm. In an upcomingwebinar series, the dairy experts from NOVUS will share their insights on howdairy farmers and feed millsin India can optimizetheircows' and feed performance.

The first sessions of the webinarseries called Balancing Act: Optimizing Milk Fat and Protein through Intelligent Nutritionwill take place in two parts: Part One at 4:00 p.m. (IST) on December 20 and Part Two at 4:00 p.m. (IST) on January 24, 2024.

Dr. Gnanasekar Rangasamy

Dr. Chetan Shembekar

Dr. Ajay Singh

"The dairy team in India is very excited to host its first-ever webinar, which explores the crucial role nutrition plays in milk and component production," says Gnanasekar Rangasamy (Dr. GS), M.V.Sc, species solutions manager - dairy for the Asia region. "Over the course of the two webinars, the team will share the factors that impact fat andsolids-not-fat (SNF), innovative feeding practices, the importance of data when planning nutritional strategies, and how milk quality impacts the financial outcomes for dairy farmers."

Part One will feature Chetan Shembekar, M.V.Sc., NOVUS technical services specialist, as he shares how different types of feed material impact both milk production and incidents of milk fat depression.

"It's not just the quantity of feed but the quality and type of feed that can impact milk production," Shembekar says. "It's important that dairy farmers understand their options and know the effect feed can have on milk, fat and SNF production."

During Part Two, Dr. GS will discuss the influence of genetics, providing a comprehensive overview of how different breeds perform, which breeds are more susceptible to milk fat production challenges, and how to identify unprofitable cows that need nutrition or management intervention.

Ajay Singh, M.V.Sc., senior technical services specialist, will provide an overview of sub-clinical mastitis and what can be done to reduce the risk of this common and costly disease.

"Udder health is necessary for good milk production," Singh says. "Understanding mastitis allows farmers to determine the steps they can take to ensure cow health and comfort."

NOVUS is the intelligent nutrition company providing solutions for the global animal agriculture industry. The company's portfolio includes bis-chelated organic trace minerals, enzymes, organic acids, essential oils, liquid and dry methionine, as well as a network of experts around the world to provide guidance on management best practices.

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CEDSI Conducts Dairy Stakeholders Workshop at GADVASU

Centre for Excellence for Dairy Skills in India (CEDSI) in association with Directorate of Extension Education, Guru Angad Dev Veterinary & Animal Sciences University, Ludhiana organized one day dairy stakeholders workshop on the theme "Opportunities and Challenge in Dairy Animal Nutrition" on 6th December 2023. Around 70 members of All Feed Millers Association (AFMA) participated. S. Inderjeet Singh; Director Dairy Development (Retd.), Government of Punjab stated that CEDSI is an autonomous institution committed to dairy skill development in India and aims to ensure sustainability and profitability in the dairy sector through skilling & capacity building, policy advocacy, knowledge management and research.

S. Jaswant Singh Kalsi, Chief Operating Officer; CEDSI informed that to improve the efficiency in agriculture production, Agriculture Skill Council of India (ASCI) has established 38 centers for excellence in different fields in India and CEDSI is one of them. This institution is committed to increase the capacity building of different stakeholders in dairy sector be it farmers, farm laborers, organizations or industries. He emphasized to improve the efficiency and cost cutting in transportation, distribution, cold chain, electricity and manpower. Dr Harsev Singh; Eminent Dairy Consultant talked about the importance of feed and fodder. He hoped that if balanced ration is provided to the animals, the milk production can be increased by 30 to 50 % in the country. Most of the farmers are either under feeding or over feeding the animals resulting in wastage of resources and productivity.

Giving the key note address Dr RK Sharma; Head Department of Veterinary Extension pointed towards the key features in profitable dairy farming i.e. breeding, management, feeding, health care and marketing. He discussed various field problems being faced by dairy farmers which can be cured by proper nutrition. He talked about prolapse, magnesium tetany and aflatoxins cases which can be prevented by proper nutrition. Dr Udaibir Chahal; Head Department of Animal Nutrition focused on what, when, where and how much to give to an animal. He advised the audience to consider different physiological stages of animals as nutritional needs change. Different seasons have different available ingredients so change the formulation accordingly.

Dr Parminder Singh, Professor Animal Nutrition discussed regulatory compliances in cattle feed industries. He cautioned the feed millers to buy quality raw ingredients and get these analyzed from the laboratory regularly. He informed the house the latest amendments and new proposed parameters of buffalo feed and calcite powder. He discussed various lacunas in existing standards and parameters to be observed in different ingredients. He also talked about the luxury of vitamins in the feed and feed ingredients. He advised to reduce the concentrate protein content in winters due to presence of high protein in leguminous fodders.

Mr Ashok Kumar; President AFMA appreciated the activities of CEDSI. He pointed towards the rise in cost of feed ingredients, particularly maize and rice as these are being diverted towards ethanol production. He worried about the fate of small feed millers in the future. Mr. Sunil Attri; Head-Silage, Corteva pointed towards the scarcity of green fodder, dry fodder and concentrate in India. He stated that cattle population is growing by 13% whereas fodder production is increasing by 4% only. He stressed upon to focus on fodder seed production, fodder banks and proper trainings to farmers to make quality silage and hay.

NEWS

Punjab starts mass Immunisation of Livestock against FMD

In order to prevent the occurrence of Foot & Mouth Disease (FMD) in the state, Punjab Animal Husbandry Department has started a mass immunisation drive of livestock.

Disclosing this here today, Punjab Animal Husbandry, Dairy Development and Fisheries Minister S. Gurmeet Singh Khuddian said that as many as 68,45,300 FMD vaccine doses have been procured under National Animal Disease Control Programme.

A total of 48,73,277 FMD vaccine doses have already been administered covering around 75% of the livestock population so far under this drive, S. Gurmeet Singh Khudian said while adding that 100% livestock population (around 65,03,505) will be vaccinated by December 20, 2023.

The Cabinet Minister informed that this vaccine is totally free and the service of administring it is being provided by the staff of Punjab Animal Husbandry Department at the doorstep of the livestock/ dairy farmers. The main objective of this immunisation drive is to protect our livestock from Foot & Mouth Disease, which has been recognized globally as a serious threat to the livestock population.

In order to save the dairy farmer from the severe milk production losses as the FMD is a highly contagious viral disease of livestock that has a significant economic impact, the Cabinet Minister said while urging the state dairy farmers to reach out to their nearest veterinary institutions to get vaccinated their livestock to eradicate this contagious disease.

ਲੀਡਰ

ਸੇਫਟੀ
ਵਧੀਆ ਇਮਯੁਨਿਟੀ
ਅਫਲਾਟੋਕਸਿੰਨ ਕੰਟ੍ਰੋਲਡ

ਉਤਪਾਦ
ਵੱਧ ਦੁੱਧ ਉਤਪਾਦ
ਵੱਧ ਫੈਟ ਅਤੇ ਐੱਸ.ਐੱਨ.ਐੱਫ.

ਮੁਨਾਫ਼ਾ
ਵਧੀਆ R.O.I
ਵਧੀਆ ਪ੍ਰਜਨਣ

- ਪ੍ਰਤੀ ਦਿਨ 25 ਕਿਲੋ ਦੁੱਧ ਦੇਣ ਵਾਲੀਆਂ ਗਾਵਾਂ ਲਈ ਸ਼ਾਨਦਾਰ ਫਾਰਮੂਲੇਟਿਡ ਖੁਰਾਕ।
- ਬਿਹਤਰ ਦੁੱਧ ਉਤਪਾਦਨ, ਫੈਟ ਅਤੇ ਐਸ.ਐਨ.ਐਫ.।
- ਵਧੀਆ ਸਿਹਤ ਅਤੇ ਬੀ.ਸੀ.ਐੱਸ. ਵਿੱਚ ਸੁਧਾਰ।
- ਖਣਿਜਾਂ ਅਤੇ ਵਿਟਾਮਿਨਾਂ ਨਾਲ ਭਰਪੂਰ, ਬਿਹਤਰ ਉਤਪਾਦਕਤਾ ਅਤੇ ਰੋਗ ਪ੍ਰਤੀਰੋਧਕ ਸ਼ਮਤਾ ਲਈ।
- ਪਸ਼ੂਆਂ ਦੇ ਲੈਕਟੇਸ਼ਨ ਪੀਰਿਯਡ ਮਿਆਦ ਲਈ ਸਭ ਤੋਂ ਵਧੀਆ ਖੁਰਾਕ।
- ਜਲਦੀ ਗੱਬਣ ਹੋਣ ਦੀ ਸਮਰਥਾ ਨੂੰ ਵਧਾਉਂਦਾ ਹੈ।

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