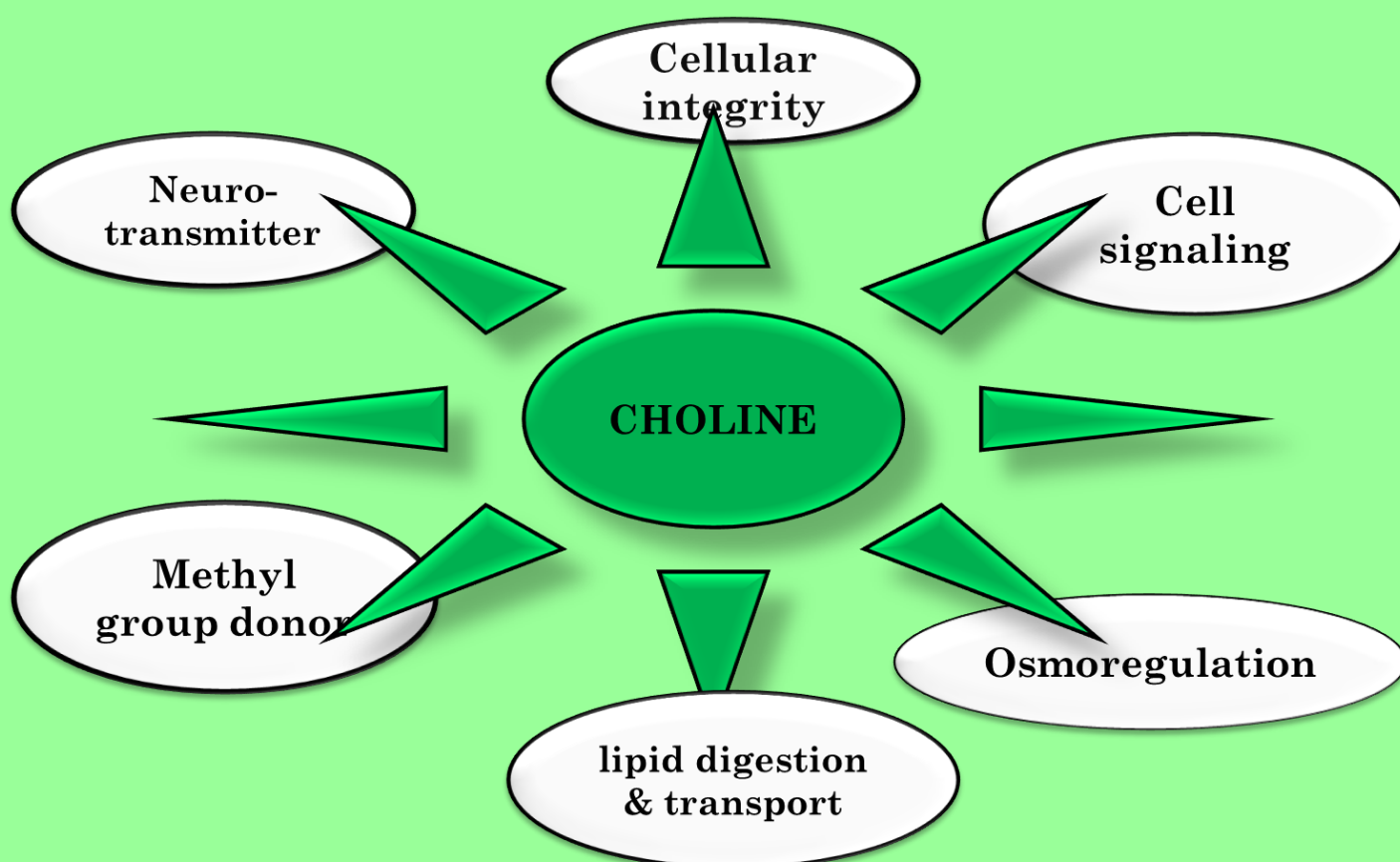




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Animal Shelter Camp: An Efficient Livestock Feeding and Management Approach during Drought Condition

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A drought is a natural calamity in which the level of precipitation is below average for given region leading to an elongated period of scarcity of water, weather atmosphere, surface water or ground water. During drought farmers suffer a lot in terms of water scarcity and fodder availability (green and dry) for their animal. In Maharashtra region drought brings making end to the daily routine their life hellish. Also unavailability of water for cultivation leading to severe shortage of fodder in such grave situation farmers are unable to maintain their animal and also costlier too. Many farmers are unable to bear the maintenance cost of animals in these critical days. Thus in orders to aid animal shelter camp (ASC) are open on cooperative basis. These camps provide the temporary shelter to animal.

A Green-house effect on global warming is a measure issue and that must be addressed globally and particularly developing countries like India. The effect of which is mainly ecological balance upside down. Some

pockets of Maharashtra come under low rainfall region. Due to increasing the climate imbalance the annual rainfall has decreased. The extent of drought period has increased leading to an enormous loss among livestock farmers. In order to assist the farmers during severe difficult time ASC are opened, these camps maintain facility of feed, fodder and basic requirements (water, shelter etc.) during the lean season. Still the novelty is reported by farmers is less. In Maharashtra there are several ASC but the function of each and every camp is different as not systematically monitored under a single unit. Though their objective remain the same, majority of farmers are reported that animals welfare was not up to the mark in the ASC. Some of the farmers are reluctant to hand over their animal during the scarcity because lack of awareness among them. The various report clearly stated that the number of death in livestock increasing day by day due to lack of knowledge and approach to handle this critical situation. As farm-

ers perception on impact reported on drought in the Upper Bhima catchment in Maharashtra state that loss of livestock, poor health of the animal, and crop failure nearly 30%, 70%, and 65-70% respectively (Udmale *et al.*, 2014). When crop fails livestock is livelihood for famers although livestock is both victim and the hope during drought. A good herd of livestock can ensure sustenance while crop failure. It is high time that government must create awareness among the farmers about ASC. Government agency along with various non-governmental agencies (NGO) creates and adopts the ASC and maintains them efficiently as well effectively for farmers welfare. Hence, the present article focused to aid the livestock farmers during drought period and to create awareness about the different strategies that farmers can adopt to face these critical situations.

Definition: drought is climate anomaly characterized by a deficiency of moisture supply due to subnormal rainfall or erratic rainfall. Drought is a condition wherein the amount of water for use in any of mass activities cannot be met for some reason. Drought differs from other natural hazards in several ways. First, drought is a slow-onset natural hazard often referred to as a normal and recurrent feature of climate, although many erroneously consider it a rare and random event. Because of the recurrent nature of drought; its effects accumulate slowly over a substantial

period of time. Therefore, the onset and end of the drought are difficult to determine.

Generally droughts are classified as either

- a) **Meteorological drought**- lack of precipitation over a region for a period of time,
- b) **Hydrological drought**-a period with inadequate surface and sub-surface water resources,
- c) **Agricultural drought**- a period with declining soil moisture and consequent crop failure due to lack of surface water resources, and
- d) **Socio-economic drought**- failure of water resources systems to meet water demands, which impacts human activities both directly and indirectly.

The India Meteorological Department (IMD) defines meteorological drought as a situation when rainfall over an area is less than 75% of the climatological normal (i.e., a rainfall deficiency of 25%).

Drought impact on agriculture and livestock

Although agriculture and livestock have been typically first and most affected sector, many other sectors, including energy production, tourism and recreation, transportation, urban water supply, and the environment, have also experienced significant losses (Wilhite *et al.*, 2014). It reduced agricultural production and yield and reduced the share of agriculture export and made food insecurity. Higher the intensity of drought lowers the kharif production. The possible effect

of drought not only limited to crops and agriculture production. Climate change will have far-reaching consequences for dairy, mainly arising from its impact on grassland and rangeland productivity. The impact of drought on cattle is manifested in four ways: 1) loss of productivity 2) health of animal 3) loss of fertility, and 4) mortality. Climate change affects cattle both directly and indirectly. The effects of air temperature, humidity, wind speed, and other climate factors influence animal performance: growth, milk production, and reproduction. Drought also reduced the availability of feed and grain, pasture and forage crop production and quality, disease and their spread.

Let's know what is Chhawani or Animal Shelter Camp?

It is a temporary arrangement for the animals during the scarcity of water and fodder where the managerial practices are carried out on a cooperative basis.

There were many ASC in Maharashtra during drought situations. Here, recognize lacunas that were in some last chhara chhawanis

1. No facilities for segregation of sick animals and healthy animals
2. Poor shelter management
3. Lack of mangers
4. Improper storage of feed and water
5. Wastage of feed in the dung

Improper storage of feed and water

The feed of cattle under normal

condition classified into three major categories such as a) Dry roughage- wheat and paddy straw, stover etc. b) Green fodder- berseem, cowpea, maize etc and c) concentrate- groundnut cake, mustard cake, cotton cake etc. while feeding the animal prime consideration is to ascertain and meet the nutritional requirement in terms dry matter (DM), digestible crude protein (DCP) and total digestible nutrients (TDN). The requirement of dry matter quantity depends upon the body weight and of the animal and also on its production (milk or meat). Cattle generally consume 2.0 to 2.5 kg dry matter for every 100 kg of body weight daily. The dry matter allowance divided into different proportion viz; concentrate (1/3) and roughage (2/3). In roughage, animals require 2/3 of dry roughages and 1/3 of green fodder for their maintenance. The requirements of DM, DCP, and TDN changes according to physiological needs and level of production in addition to maintenance. However, during the drought there is a severe shortage of animal fodder especially roughages. At this stage, the available green fodder should be well stored under shed area



and due care should be taken to not dry early. It is feed to the animals as early as possible and timely otherwise that stocks of green fodder can get fermented in the high temperature of drought. Which will produce fungus in that and animals can get easily vulnerable to mycotoxicosis problems. So,



accessible green fodder should be well stored and supplied.

Lack of mangers

Inappropriate or lack of feed mangers and waterers which leads to the wastage of feed and fodder as it gets mixed with soil and can also spread disease by mixing with soil. As wastage of feed in soil leads to 7 to 10% of the loss of fodder.

No facilities for segregation of sick animals and healthy animals into the chhawani

There is no report of a facility of segregation of animals into the chhawani as it enters, animals are randomly kept into the chhawani anywhere. This support the easy transmission of disease and ectoparasites from the affected animals to unaffected animals. Various diseases are contagious and can easily transmit between animals. Ectoparasitic infesta-

tions are common modes of transmission of fatal microorganisms which can be detrimental to entire livestock as well as human.

Poor shelter management

Improper shade or without shade leads to heat stress. As in those sunny days, the incidences of the heat stroke are more and animals can easily get suffered from heat stroke. The animal will reduce feed intake and increase water consumption. There is insufficient space for the animals. Overall



the hygiene is not maintained.

Wastage of feed in dung

During drought, the supply of fodder becomes limited crop residues are used as fodder. At this position, the feed wastage in dung should be



minimized.

Lack of basic needs

As when we put a sight on the

overall chhawani we will definitely recognize the needs of basic things (good quality fodder, feed manger, clean and cold drinking water, segregation unit etc.) which are a lack in the current chhawani to be carried out daily managerial practices. Above are some indicative adversities in the chhara chhawanis. These adversities can be improved by using and performing some economical materials and actions.

What is to be done????

Here are some suggestive improvements to be done in chhawani for better disposition of living of animals.

Maintenance of nutrition by using strategies

In the drought, there is an acute shortage of feed, fodder and drinking water for livestock. Therefore, survival of animal at minimum cost, using alternate possible feeding strategies, should be the primary aim during such condition. In our Indian conditions, drought animals are maintained in the poor quality pastures, straw and crop residues. During the drought, season animals are maintained on a low maintenance diet. Critical body weight for survival will be up to 20% of body weight loss in the case of cattle. In case of high yielding milch animal and other producing animals, the only solution lies with supplementation because once the productivity lost cannot be recouped with by any other means.

Chaffing of fodder

Cutting of fodder to make chaff



(kutti) in 2-4 cm length to avoid large quantity of wastage of fodder in dung and soil. This increases digestibility and total surface area of fodder for the fermentation process in the rumen.

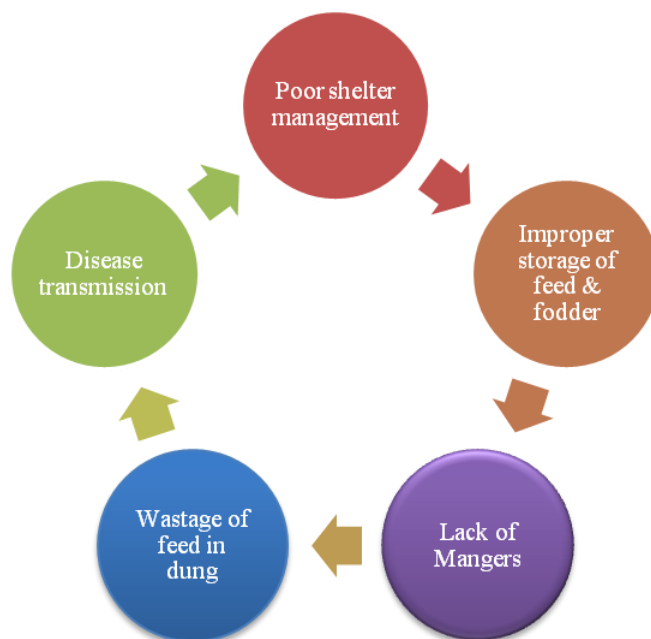
Mobile bag silage

Transportation of silage from one place, where silage production is abundant is the best and cheapest option. The mobile bags are less expensive,



the quality of silage can be almost as good as when stored it in an oxygen-limiting silo pit. A well filled and well-packed bag has very little chance to mold formation. It can be kept for a longer period. These bags prevent oxygen infiltration into it.

Urea treatment on straw, stovers and dry fodder



Straws and stovers are usually poor in nutritive value having low crude protein content. Urea has been used extensively to improve the nitrogen content these poor quality roughages. It's is the chemical treatment better practically potential under field conditions. It helps to give economic returns to the farmers to and also contributes to reducing land area which is required for green fodder production. The process of urea treatment on straw is as follows - the recommended level of urea for the enrichment of straw is 2-3%. Straw is spread on the



the thickness of 3-4 inches. Make 2% of urea solution (2 of urea in 98 liters of water) and is spread on straw and straws has to be turned every time. These enriched straws are offered to lactating cows. This results in extras yield of 0.5-1.5 kg milk or saves 20-30% of concentrate ration with the reduction in 20-30% of feed wastage. This process increases palatability and the nutritive value of dry fodder.

Enrichment with urea molasses

Urea - 2 kg, molasses - 10 kg, mixed together and dissolved into 100 liters of water. This mixture is spread on 100 kg of straw or bagasse and dried in the sun. This method provides nitrogen and readily available source of energy to the ruminal microflora for the utilization of the urea.

Urea Molasses Mineral Blocks (UMMB)

This compact blocks can be easily made, stored and transported in scarcity. In India, drought maintenance crop residues (straw and stovers) and

floor of thick polythene sheet uptown

dried grasses are mainly available for an animal which are deficient in protein and essential nutrients. Molasses 38%; urea -10%; portland cement - 10%; wheat bran - 40%; salt -1%; mineral mixture -1%; vitablend - 1g/100kg. These ingredients are mixed as follows - Water, urea, salt, mineral mixture, vitablend, cement, molasses, and wheat bran. This mixture is transferred to molds to form blocks and thus blocks are allowed to settle for a period of 24 hr.

Sugarcane bagasses as animal feed

Sugarcane is a major crop in Maharashtra and India, popular among farmers. In India 383 MMT of sugarcane bagasses produced annually. Varieties of methods are there to improve its nutritive value. Growing animals can be raised on complete feed containing 30% sugarcane bagasses, 20% Prosopis julifera pods, 7% mango seed kernel, 12% babul seed chuni, 8.5% maize gluten, 12% corn steep liquor, 8% molasses, 0.5% urea, 1% salt, and 1% mineral mixture. This strategy was successfully applied in Maharashtra during the drought of 1972-73 for this chhawani were located around the sugar factories.

Unconventional feed resources

Some feeds and fodders which are not generally used for animal feeding can be used during drought condition. Under this following is some good options A) Feeding of spineless cactus (Opuntia spp.) for cattle: cactus is drought tolerant species, which grows

in a harsh environment. It is performing a good source of green fodder and nutrition. During feeding to the animal it should be supplied with dry fodder, protein supplements and balance the mineral with mineral bricks and jaggery to improve palatability. B) **Mornings (drumstick) leaves and pods**

Fast growing, drought resistant Tree. It grows in best in dry sandy soil and also tolerates poor soil. Moringa is popularly known as drought tolerant tree which grows best between 25°C to 35°C and survives up to 48°C. This tree is Rich in minerals like calcium and iron with, high level of methionine and cystine amino acids. Vitamins are with a high value of beta-carotene, but vitamin k and energy. Dry leaves of moringa contain more in ascorbic acid.

Azolla (floating fern)

During a drought situation, there is a shortage of good quality feed and fodder have long been recognized as a potential source of proteins. An alternative to protein supplement with poor quality crop residues as a maintenance feed, provided drought is of moderate intensity and allow at least some water to utilize for Azolla production. Azolla has very rich protein, essential amino acids, growth promoters, vitamins, intermediaries and mineral like calcium, phosphorus, ferrous, potassium, copper, magnesium, etc. On a dry matter basis, it constitutes 25-35% protein content.

Compressed complete feed block (CCFB)

A novel feeding system has been evolved in last two decades known as a complete feed. This system is economical and efficient as it allows inclusions of low cost agro-industrial by-products and low-quality crops residue with their efficient utilization. It is a system of feeding roughages, concentrates and supplementation of other nutrients together in blended form.

Manger improvement

Certain modification in the management in the manger with practicable thing are necessary to overcome the wastage of feed. Plastic barrels, wooden box, tires bags can be used as manger for the feeding of the animal in a scientific and economical manner with a saving of feed.

Water management

The most important commodity in drought. Providing clean and safe water is just because animals can be survived without feed for a longer duration but it cannot survive for long without water. During summer large animal requires 80 to 100liter/day. Water should be mixed with 'jaggery' as it quenches the thirst. Water should be stored in big tanks like Syntex as to minimize the additional wastage of water and try to store in the shed, avoid the providing hot water to the animal. Use a temporary available material for watering as water troughs made of tin or plastic. Feeding and watering order- feeding and watering to the livestock is according to the priority order. Suckling without mother > suckling with

mother > producing and working animals > adult non-producing animals > sick and disease animals > aged animals

Registration and record keeping of each animal

Each animals entering into the camps out to recorded along with owner's details and its release from the camp should also be recorded. By using a card or tag for easy identification of animals. Registration of the animals will help you for the provision of feed, treatment and other issues. Record keeping for various purposes. As for the reduction of theft of good animals when chhawani get over.

Screening and segregation of animals

This is the most important step to be followed by chhawani authorities. Because it has been observed that the livestock population are more affected during or post ASC due to the rapid spread of the different epidemic and or endemic disease. If suitable measures are not taken in time may result in huge economic loss to the farmers. If the animals with the diseased condition should be isolated from healthy ones for further diagnosis and treatment. Which will reduce the transmission of disease, ectoparasites, microorganisms within animals?

Isolation ward

This is for the diseased animals for the effective treatment and control of disease transmission.

Mobile veterinary clinic

Along with feed and fodder we

should provide adequate health care and prompt provision of veterinary services for the betterment of livestock. The sooner the veterinary help reaches the lesser will be the suffering to animal. For efficient veterinary services for 24×7 with possible necessary facilities for diagnosis and treatment. To reduce the worm load of animals, immediate action should be taken for deworming. The animals in the camp should be vaccinated against various bacterial and viral infectious diseases (Foot and mouth disease, Hemorrhagic septicemia and Black quarter). Veterinarians with their supporting staff should keep emergency kit ready always and be ready to move whenever required. Travis would be there for treatment purpose.

Efficient shelter

If no trees or shade are available, shelter the animal under tent or shamiana. Construction of good and shaded shelter with the use of bamboo sticks, wooden bally, roof with coconut leaf, sugarcane tops, rice straws, thatch, green net etc. would be key to reduce heat stress in animals. Great emphasis should be paid to hygiene and sanitation, especially prompt animal waste (dung, urine, and feed waste etc.) disposal, in the camps, a fact often neglected by farmer and organizers. Manure storing area should be away from the animal's shelter, feed and fodder stored area, and water tank.

Other mitigating and preparedness activities should be done:

Mitigation

1. Insurance to each animal
2. Basic first aid kit
3. Entry passes and daily ration card system
4. Follow strict vaccination schedule against the infectious diseases
5. Store the crop harvest and crop residues for livestock
6. Feed sample testing to the feed which arises into the chhawani
7. Wastage recycling of dung to vermicompost, dung cakes, etc
8. Food, water, and disaster supplies for farmers
9. Help and funding from Government, NGO's, pharmaceuticals, feed mill companies, dairy industries, etc
10. Professional approach to feed management
11. Loans from banks at cheaper rates for purchase of fodder must be made available
12. Coordination of disaster management institutes with animal nutrition faculty
13. Farmers awareness campaign by extension training for management of livestock during drought
14. Use of technology such as television, radio, newspaper to disseminate useful information to mitigate the drought

Preparedness

1. Creation of feed and fodder bank
2. Pasture improvement
3. Application of fodder conservation activity

4. Introduction of drought- resistant and water logging plants variety
5. Promotion of seeds that flourish from the first irrigation
6. Management of stocking rates
7. Evaluate and revise the drought management plans

Conclusions

Drought is a recurrent feature of climate and it is increasing in frequency, severity, and duration in the country and it occurs every year in one or the other region of the country and feeding management is very critical under such situation. In such a situation, animal shelter or relief camps are one of the most required and available options in front of farmers. Certain modifications in the management of ASC with practicable things are necessary to overcome the drought-like conditions. Plastic barrels, wooden boxes, tires, bags of feed can be used as a manger for the feeding of the animal in a scientific and economical manner with saving on feed and avoid feed wastage.

Dried sugarcane tops, rice, and wheat straws, and green-net can be used for shelter. Urea treatment for increasing the nutrient value of poor quality roughages, mobile bag silage, fodder bank, chaffing the fodder can be adopted efficiently. Using a low budget can be used for feeding animals. Adoption of scientific management practices of ASC, the animals can be maintained with good health status in drought conditions and we can save the precious livestock and

save the livelihood resource of farmers. As discussed various management methods those are vital and will be helpful to prevent loss productivity especially in lactating animals.

Livestock rescue and rehabilitation plans should be developed as a part of Standard Operating Procedures. Optimal use of scarce resources is necessary to enhance quick recovery and maximizing coverage. Livestock relief plans should be developed as a part of preparedness activity in India and not during a natural disaster. Administrative strategies and helps plays a very crucial role in adapting to drought, so prompt action should be taken to prevent loss and save the life of an animal.

REFERENCES

- Wilhite, D. A., Sivakumar, M. V., & Pulwarty, R. (2014). Managing drought risk in a changing climate: The role of national drought policy. *Weather and Climate Extremes*, 3, 4-13.
- Udmale, P., Ichikawa, Y., Manandhar, S., Ishidaira, H., & Kiem, A. S. (2014). Farmers perception of drought impacts, local adaptation and administrative mitigation measures in Maharashtra State, India. *International Journal of Disaster Risk Reduction*, 10, 250-269.