The Pharma Innovation Journal 2023; 12(6): 3253-3255

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2023; 12(6): 3253-3255

www.thepharmajournal.com
Received: 19-03-2023
Accepted: 25-04-2023

Sneh D Patel
M.V.Sc. Scholar, Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Junagadh, Gujarat, India

Bharat A Pata
Ph.D. Scholar, Department of Livestock Production Management, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Junagadh, Gujarat, India

Gaurang P Mathukiya
M.V.Sc. Scholar, Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Anand, Gujarat, India

Corresponding Author:
Sneh D Patel
M.V.Sc. Scholar, Department of Animal Nutrition, College of Veterinary Science & Animal Husbandry, Kamdhenu University, Junagadh, Gujarat, India

Feeding strategies of livestock during natural calamities: A review

Sneh D Patel, Bharat A Pata and Gaurang P Mathukiya

Abstract
India is one of the most disaster-prone nations. The primary cause of natural disasters like avalanches, earthquakes, floods, cyclones, famines and tsunamis. Natural disasters have caused severe shortages of food, feed, fodder and beverages which have a negative impact on the health and nourishment of people and animals and can reduce their ability to produce and reproduce. The main goal during a natural disaster should be to prevent many animals from going hungry. Feeding restrictions should be chosen. Restricted feeding results in weight loss and decreased milk production in lactating animals, but it also guarantees the animals survival. Restricted feeding, stored feeds in portable silage bags, feed produced in inexpensive hydroponic systems, unusual feed sources like thornless cactus propagation and multinutrient blocks made of urea and molasses are a few of the strategies used to prevent livestock morbidity and mortality in situations of emergency.

Keywords: Natural calamities, livestock, feeding management

Introduction
An immense number of people depend on natural resources for their livelihood, particularly in developing nations. Livestock plays a significant role in these economies. When it comes to drought, famine and other natural disasters, livestock is the greatest form of protection against the unpredictability of nature. Due to its particular geo-climatic conditions, India has historically been susceptible to natural catastrophes like cyclones, floods, droughts, earthquakes and landslides. Floods are the most devastating of the numerous natural disasters that cause significant loss of vegetation. In the Indian subcontinent, monsoon failure predominately defines famine. Natural disasters main impacts include serious shortages of feed, food, fodder and drinking water, which have a negative impact on the health and nutrition of people and animals. Natural disaster-induced severe malnutrition may impair development, productivity, and reproductive capacity. As a result, maintaining animals through feeding methods is necessary to ensure their survival both during and after a natural disaster. Animals are not harmed by man-made catastrophes, but they can exacerbate other circumstances like political unrest, industrial accidents, pollution or environmental degradation (Anonymous, 2011) [1].

Feeding strategies during natural calamities
Because keeping livestock alive ensures communities survival after the occurrence of a drought or catastrophe, feed security for livestock should be considered to be as important as food security for humans during natural calamities (Bakshi *et al.*, 2018) [4]. Food safety for animals should be given the same priority as food safety for humans in the case of a natural disaster. To prevent the negative effects of a moderate diet/malnutrition, the greatest task is to restore the serious food shortages. In the case of a natural catastrophe, saving livestock from starvation should come first and maintaining the life of the product should come second. A reduction in body fat is the primary cause of animal fatalities during droughts. If the livestock has sufficient fat, it is going to utilize it as an alternative source of energy while losing weight. Providing food with a moderate energy level and following the guidelines for a nutritious diet (Table 1) lowers the chance of illness.

Table 1: Short term dietary requirements of animals during natural calamities

Animals	Water (l/d)	Feed (kg/d)
Dairy cows		
In production	26.5-34.0	9.1 hay
calf	15.0-22.7	3.6-5.4 legume hay
Swine		
Brood sow with litter	15	3.6 grains
Brood sow (pregnant)	11.4	0.9 grains
Sheep		
Ewe	2.8	1.4 hay
Weaning lamb	1.89	1.4 hay

Feeding of densified complete feed block (CFB)

To prevent animal deaths during natural disasters, this technology can be used as an efficient disaster management strategy. Feeding concentrates and roughages in combination as a complete diet is a practice. A complete feed block consists of forage, concentrate and other supplemental minerals in the right amounts to meet an animal's nutritional needs. This method is cost-effective and effective because it enables the use of low-cost agricultural industrial byproducts, readily available local crop residues and unconventional feeds. Rice straw that has been chaffed and either untreated or urea-treated can be used as base roughage that is augmented with molasses, binder, mustard cake, rice bran as well as hay. Complete feed provides readymade, balanced, low-cost ruminant rations for landless labourers and tiny farms. The blocks can be easily transported to the area with a feeding shortage or prepared during a surplus season and fed to animals during a shortage to prevent significant livestock loss.

Feeding of urea molasses mineral blocks (UMMBs)

For ruminant livestock, the urea molasses mineral block (UMMB) is a strategic feed additive. Ruminant feed contains a combination of energy, protein and minerals to help animals endure natural disasters until pasture conditions recover. The UMMB is an easy and affordable way to give the creatures a variety of nutrients. UMMB can increase the utilization of low-quality roughages by meeting the nutrient needs of rumen microorganisms, improving the environment for fibrous material fermentation and increasing the production of microbial proteins and volatile fatty acids. Depending on the component's local availability, nutritional value, cost, accessibility to facilities for their use and impact on block quality, the blocks can be made from a range of materials. UMMB maintenance should be avoided for young calves because their rumen is not well developed (FAO, 2007) [7]. NDDB created UMMB with the following component description.

Table 2: Composition of UMMB

Components	Parts per 100 kg mixture
Molasses	45
Urea	15
Cotton seed cake	10
Mineral mixture	15
Salt	8
Calcite powder	4
Sodium bentonite	3

Urea treatment of straws/stovers

The grass is moistened to 40% humidity by adding a 3.5% solution of urea (Bakshi and Wadhwa, 1999) [5]. One appealing method to increase the nutritional value of subpar agricultural residues is natural fermentation of straws/stovers with urea. The amount of urea to be added is typically added as a solution in water (4 kg urea/60 lit. water), which is then sprinkled on the straw. The suggested treatment rate is 40 g urea/kg straw. By the ninth day, it was found that more than 85% of the added urea had been hydrolysed, completely eliminating the possibility that animals given treated straw would become toxic to urea. Under real-world circumstances, the technique demonstrated to be extremely practical. It can be used everywhere to increase the nutritional content of a variety of cereal stalks, including those from wheat, rice, barley and oats as well as maize, sorghum and pearl millet. The quality of the seasoned straw does not degrade over the course of more than a year of storage. If used effectively, the processed straws, stalks and stovers could protect the cattle population during natural disasters.

Liquid urea-molasses feeding

Liquid molasses fortified with vitamins and minerals and having 2 to 3 percent evenly mixed urea is referred to as liquid feed.

Table 3: Composition of liquid urea-molasses

Components	Parts per 100 kg mixture
Sugarcane molasses	92.0 part
Urea	2.5 part
Fresh water	2.5 part
Mineral mixture	2.0 part
Common salt	1.0 part

Uromin lick

Along with urea, molasses and minerals, this "uromin" lick, also known as "Pashu Chaat," also includes additives like Deoiled rice bran, maida (sieved flour), mustard cake, common salt and a feed binder. (Bentonite or guar gum).

Table 4: Composition of uromin lick

Components	Parts per 100 kg mixture
Molasses	30
Urea	10
Deoiled mustard cake	10
Deoiled rice bran	10
Common salt	10
Mineral mixture	15
Maida	15
Sodium bentonite	3

Densified complete feed pellets (DCFPs)

For the creation of grass-fed feeds, ingredients like wheat, soy, mustard and cotton fibres can be used. The following ingredients may be included in feeding pellets: 30- 35% crushed grass, 10-12% molasses, 35-40% deoiled rice bran, 10-15% oily food, 1% urea, 1% common salt, 1.5% calcite powder and 1% mineral combination (FAO, 2012) [6]. Feeding 6-8 kg / day of these pellets can support body retention and 3-4 kg of milk / day.

Silage technology for scarcity period

The procedure only entails evenly spraying urea solution over the straw and keeping it for a predetermined amount of time. Every day, a lot of extra fruit goes to trash, creating a major

disposal issue. These fruit by products are usually rich source of soluble carbohydrate also contain little amount of protein to enable microbial fermentation, so this can be ensiled with paddy straw and poultry droppings. The paddy grain needs to be chaffed and combined evenly with the other two ingredients. A silo like this needs to be maintained for at least 4 weeks before animals can be fed from it.

Dry and fallen tree leaves

Neem, mango, banyan, pipal, babul, subabul, mahuva and other foliage can be used as green fodder in times of shortage. Tree leaves are an excellent supply of calcium, carotene and protein (Singh and Chandramoni, 2010) [10]. Animals find complete feed tasty and it can make a fine maintenance ration when made with 50 kg of tree leaves, 5 kg of groundnut cake, 25 kg of vilayati babul pods (*Prosopis juliflora* pods), 15 kg of molasses, 1 kg of urea and 2 kg of mineral mixture.

Feeding of grains

Since grain can be transported into trucks more easily than roughages, it is also provided to animals in emergencies on a global scale. Food cereals nutritional value is avoidable. If fed, animal feed should be raised in a responsible manner (FAO, 2016) [8].

Use of conserved fodders

There is a severe lack of feeds and fodders during droughts or storms. Transporting green, ensiled, dry roughages from surplus regions to deficient areas can significantly close the supply-demand imbalance. Harvesting and chaffing of maize, sorghum or bajra green fodders can be done directly or with a tractor equipped with a single-row or self-propelled multiple-row harvester. Fruit and veggie wastes, with or without wheat or rice straw, can also be ensiled. Baby maize husk or fodder is gathered and wilted for a few hours in summertime and 1-2 days in wintertime before being chopped and ensiled like traditional fodders (Bakshi *et al.*, 2017a) [3]. Fresh empty peapods available after shelling peas is an excellent source of nutrient for ruminants.

Feeding of low-cost hydroponic fodder

By feeding hydroponic fodder, the severe scarcity of green fodder that occurs during drought and other natural disasters can be significantly reduced. Green fodder can be grown hydroponically without soil by using stream water. A review of hydroponic fodder production showed that the inexpensive hydroponic system can be used successfully in times of natural disaster (Bakshi *et al.*, 2017b) [2]. Depending on the hardness of the seed coat, clean, whole, untreated, viable seeds/grains of good quality are soaked at 23 °C in fresh aerated water for 4 to 24 hours before being washed in tap water and re-soaked. The seeds are distributed up to one centimetre deep in plastic or light metal trays with holes to allow waste water to drain, after soaking. For the production of hydroponic barley, wheat or sorghum fodder, the suggested seeding rate is 4-6 kg/m^2 and for the production of maize fodder, it is 6.4–7.6 kg/m^2. In comparison to the space and water needed for traditional fodder production, hydroponic technology needs only 1-3% of the space and 25-50% of the water. A kilogramme of unsprouted seed produces 6–10 kg of verdant forage in 7-8 days.

Use of unconventional feeds

These feeds assist in decreasing the shortage of animal feeds and in improving the cost and profitability of livestock production. It is possible to feed livestock with some unusual feed materials, such as rubber seed cake, niger seed cake, tea waste, mango seed kernel, ambadi cake, tamarind seed powder, mahuva seed cake, mahuva flowers, subabul seeds, sea weeds, rain tree pods, tomato waste, isabgul gala and isabgul lali, neem cake, kusum cake, palm male flower, jowar gluten and jowar cake (Patil, 2006).

Conclusion

Natural disasters seriously impair livestock health and nutrition and cause a severe scarcity of food, feed and drinking water. To avoid starvation, feeding management during a catastrophe must be handled with extreme care. The challenge can be met by using feeding techniques like UMMB supplementation to roughages, feeding of full feed blocks, urea treatment of straws, feeding of dry and fallen tree leaves, hay and other conserved fodder. Alternative meals and wastes can also help to lessen the problem. The affected animals should receive compensatory feeding to regain lost weight and production once the situation is under control and feedstuff availability after a natural catastrophe improves.

References

1. Anonymous. Natural Disasters in India. Ministry of Home Affairs, Government of India; c2011. ndmindia.nic.in/
2. Bakshi MPS, Wadhwa M, Makkar HPS. Hydroponic fodder production: A critical assessment. Feedipedia Broadening Horizones. 2017b;46:1-10.
3. Bakshi MPS, Wadhwa M, Makkar HPS. Utilization of baby corn by-products and waste as livestock feed. Broadening Horizones. 2017a;44:1-4.
4. Bakshi M, Wadhwa M, Makkar H. Feeding Strategies during Natural Calamities. Indian Journal of Animal Nutrition. 2018;35(1):1-21.
5. Bakshi MPS, Wadhwa M. Feeding strategies for incorporating crop residues in ruminant's ration. In: "Proc Animal Nutrition Workers Conference" (K.K. Singhal and S.N. Rai; eds.) held at Hyderabad, Andhra Pradesh, India; c1999. p. 52-58.
6. FAO. Crop residue based densified total mixed ration. A user-friendly approach to utilise food crop byproducts for ruminant production, (T.K. Walli, M.R. Garg and H. P.S. Makkar). FAO Animal Production and Health Paper No. 172. Rome, Italy; c2012.
7. FAO. Feed supplementation blocks-Urea-molasses multinutrient blocks: simple and effective feed supplement technology for ruminant agriculture. FAO Animal Production and Health Paper No. 164. (H.P.S. Makkar, Manuel Sánchez and W. Andrew Speedy; eds.); c2007, p. 248.
8. FAO. Livestock-Related Interventions during Emergencies. The How-To-Do-It Manual. (Philippe Ankers, Suzan Bishop, Simon Mack and Klaas Dietze; eds.). FAO Animal Production and Health Manual No. 18. Rome, Italy; c2016.
9. Patil NV. Major nutritional implications and strategies to overcome ill effects of drought in livestock. In: "Feeding of Livestock during Draught and Scarcity a Short Course" held at Central Arid Zone Research Institute, Jodhpur, India; c2006, p. 9-20.
10. Singh P, Chandramoni. Feeding of farm animals during scarcity. Dairy Year Book; c2010, p. 93-95.