

Impact of Nutritional Insecurity under Changing Climatic Scenario

OP Dinani¹ and S Mishra^{2*}

¹Instructional Livestock Farm Complex, College of Veterinary Science and Animal Husbandry, Anjore, Durg, Chhattisgarh Kamdhenu University, Durg, India

²College of Veterinary Science and AH, Anjora and Director, Kamdhenu and Panchgavya Research Center, Chhattisgarh Kamdhenu University, Durg, India

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***For Correspondence**

Sharad Mishra, Professor and Head (LPM), College of Veterinary Science and AH, Anjora and Director, Kamdhenu and Panchgavya Research Center, Chhattisgarh Kamdhenu University, Durg, India.

E-mail: lpmsarad@rediffmail.com

All nutrients are essential for normal physiological function of body. Deficiency or excess of any nutrient in the diet produces metabolic diseases. Food security means all animals including human must have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences at all times for an active and healthy life. Food security coupled with a sanitary environment, adequate health services and knowledgeable care to foster good nutritional status through the life cycle and across generations is known as nutritional security.

About one third of the total world food and feed produced are lost through improper storage, purification and contamination due to which a billion populations suffering from hunger and up to 2 billion experienced hidden hunger. It has been estimated that about 50% to 70% increase in food productivity will be needed by the end of 2050 for global food security. World food and feed demands are increasing due to increase in human, livestock and poultry population along with increase demand of biofuel. Poverty, food and nutrition insecurity are intrinsically linked. The reports indicate that about 70% global compounded feed goes to monogastrics. Poultry and livestock supply 16% of the energy and 28%-35% protein consumed globally. About half of the total world grains and 77 MT of plant protein are fed to livestock and poultry so as to produce 58 MT of animal protein.

Food and feed quality are important due to harmful residual effects of chemicals connected by the food chain. A billion extra tons of grain will be required to satisfy future food, feed and biofuel demands. Livestock convert low-biological-value protein foods that are less palatable and less nutrient dense to high-biological-value foods that are highly palatable and nutrient dense.

Mycotoxin in feed are considered to be the second most serious issues in feed industry following increased feed price. Many strategies have been attempted in the past to counteract the adverse effect of mycotoxins on livestock health and production. Some of the mycotoxin binders (adsorbents) extensively studied in poultry is activated charcoal, hydroxyl sodium calcium aluminosilicate (HSCAC), bentonites, zeolites etc. Various chemicals such as veterinary drugs (antibiotics/coccidiostats), agricultural (pesticides/fungicides), industrial (dioxin), heavy metals (lead/mercury/cadmium) and adulterants (melamine) may enter into the livestock feed. The major cause of concern in livestock feed in terms of microbial contamination is Salmonella which is associated with food poisoning in humans.

Climate change poses formidable challenge to the development of livestock sector. The anticipated rise in temperature between 2.3°C and 4.8°C together with increased precipitation resulting from climate change is likely to aggravate the heat stress, adversely affecting their productive and reproductive performance, and hence reducing the total area where high yielding livestock can be economically reared.

The genetic manipulation has produced a number of new transgenic varieties of commodity crops with desirable features, such as protection against common pests, tolerance to herbicides, and improved nutritional quality characteristics. Commercial formulations of such Bt-based products have been registered for use on food crops in the US since 1961. However, questions regarding the digestive fate of DNA and protein from transgenic plants have been raised in regard to human consumption and trade of animal products e.g., meat, milk and eggs from animals fed transgenic crops. In addition to feed safety assessment, including safety for consumers, animals and environment, nutritional assessment of feed produced using recombinant DNA techniques is necessary and should be considered as an essential part of safety assessment. Strict legislation on the use of

insecticides and pesticides during either production or storage of feed ingredients is required globally. Organic farming is gaining popularity now days as it produce environment healthy safe food.

Thus, it is concluded that mandatory regulations are needed for feed safety similar to that of human food. Establishment of strong regulatory body for enforcement of regulations is needed. Establishment of reference & central laboratory for animal/ poultry feed analysis and quantifying the harmful chemical residues are required. Packaged livestock feed should be certified for quality assurance, should mention the nutrient composition, packaging date and best before date. Sun drying and processing of feed is an effective way to minimize microbiological hazard. Effective rodent control programme and integrated pest management are needed. Use of bio-pesticide & bio-fertilizers to minimize chemical residues should be done. Encourage organic farming to minimize chemical residue in food chain. Revision of regulation for GM/transgenic crops is needed at global level. Food processing and preservation techniques for food security and increased nutrient availability at the household level are global need. Combining food, health and nutrition in agricultural research is needed to support one health concept. Advocacy for agricultural and health policies to incorporate nutritional objectives are needed. Thus, it may be concluded that availability of nutrients at reasonable price are basic prerequisite for prevention on metabolic diseases, maintaining immunocompetence, optimum production and reproduction performance in livestock and human being.