



Managing Thermal Stress for Sustainable Livestock Farming

For Prelims: Sustainable Livestock Farming, Thermal Stress, Livestock Sector, Dairy, Rastriya Gokul Mission, AHIDF.

For Mains: Sustainable Livestock Farming.

Why in News?

Thermal stress poses a serious threat to **Sustainable Livestock Farming** in Kerala.

- In Kerala more than **95% of the cattle are crossbreeds with low thermal tolerance** compared with native Varieties. Kerala Veterinary and Animal Sciences University (KVASU) has started a project for selecting cattle in the context of climate change to cope with Thermal Stress.

What is Thermal Stress and its Impact on Livestock?

- **About:**
 - Thermal stress refers to the **physiological and metabolic responses** of animals to elevated temperatures that exceed their comfort zone.
 - It occurs when the **animal's body is unable to maintain its normal internal temperature**, and it results in a range of negative effects on the animal's health and productivity.
- **Causes:**
 - Thermal stress can be caused by a variety of factors such as **high ambient temperature, humidity, solar radiation, and lack of proper ventilation** or cooling mechanisms.
 - It is a significant concern in livestock farming as it can have **severe economic and animal welfare consequences**.
- **Impact of Thermal Stress:**
 - **Reduced Productivity:** High levels of thermal stress can cause **a decline in milk production, decreased feed intake, and weight loss** in livestock animals. This can lead to a reduction in productivity and income for farmers.
 - **Health Issues:** It can cause various health issues in livestock animals, including **respiratory distress, heat stroke, and dehydration**.
 - This can lead to **increased susceptibility to diseases**, lower immunity, and reduced lifespan.
 - **Economic Losses:** Livestock farmers may face significant economic losses due to thermal stress and consequent health issues and high mortality rates.
 - Farmers may **also have to incur additional costs to provide their animals with cooling mechanisms**, such as fans or sprinklers.
 - **Environmental Impact:** In order to mitigate the effects of thermal stress, farmers may have to **resort to unsustainable practices such as the excessive use of water for cooling**, which can have a negative impact on the environment.

How can Livestock be Prevented from Heat Stress?

- **Breeding Management:**
 - A good heat detection program is necessary to detect cows with marginal heat symptoms as cows exhibit lesser heat symptoms during heat stress.
 - It is always advisable to **continue [AI \(Artificial Insemination\)](#) breeding** instead of using bulls because in natural breeding both bulls and cows suffer infertility due to summer stress.
- **Cooling Systems:**
 - Fans in combination with water sprinkling facility can be **provided but excessive sprinkling should be avoided** as it can result in wet bedding and make animals prone to [mastitis](#) and other diseases. The farm should be well ventilated.
- **Feeding Management:**
 - Thermal stressed animals are more prone to lower **reproductive and productive performance**.
 - Feeding **high quality forages and balanced rations can decrease some of the effects of thermal stress** and boost animal performance.
- **Selection of Heat Tolerant Animals:**
 - Genetic selection of animals based on specific molecular genetic markers for heat tolerance **can be a boon to alleviate heat stress in cattle** and buffaloes by identifying the heat tolerant animals.

What is the Scenario of the Livestock Sector in India?

- The livestock sector grew at a [CAGR \(Compound Annual Growth Rate\)](#) of 7.9 % during 2014-15 to 2020- 21 (at constant prices), and its contribution to total agriculture GVA (Gross value added) has increased from 24.3 % in 2014-15 to 30.1 % in 2020-21.
- **Dairy** is the single-largest agri commodity in India. It **contributes 5% to the [national economy](#)** and employs 80 million dairy farmers directly.

What are the Initiatives Related to Livestock Sector?

- [Rashtriya Gokul Mission](#)
- [Animal Husbandry Infrastructure Development Fund \(AHIDF\)](#)
- [National Animal Disease Control Programme](#)
- [National Artificial Insemination Programme](#)
- [National Livestock Mission](#)

Way Forward

- Promoting Sustainable Livestock farming involves a multi-faceted approach that includes implementing proper animal welfare practices, adopting sustainable production methods, reducing waste and emissions, promoting local and regional markets, and providing education and training programs to farmers.

UPSC Civil Services Examination, Previous Year Questions (PYQs)

Prelims

Q. Consider the following statements: (2019)

1. Agricultural soils release nitrogen oxides into environment.
2. Cattle release ammonia into environment.
3. Poultry industry releases reactive nitrogen compounds into environment.

Which of the statements given above is/are correct?

- (a)** 1 and 3 only
- (b)** 2 and 3 only
- (c)** 2 only
- (d)** 1, 2 and 3

Ans: (d)

Mains

Q. Livestock rearing has a big potential for providing non-farm employment and income in rural areas. Discuss suggesting suitable measures to promote this sector in India. **(2015)**

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