PROJECT INFORMATION

Surveillance, pathology, diagnosis and management of hemo-protozoan infections in dairy cattle of the west coast region of India

PROJECT OVERVIEW

Funding Agency	Institute
Total Outlay	50, 10,000
Duration	3 years
Single / Multi-Institutional	Single
Principal Investigator	Dr. Shirish D. Narnaware
Co-Investigators	Dr. Susitha Rajkumar, Dr. Gokuldas P.P., Dr. Sanjay Udharwar

RATIONALE

Dairy animals play a pivotal role in sustaining rural livelihoods, nutritional security, and the rural economy of India. However, productivity in dairy animals is severely compromised due to various infectious diseases, among which hemoprotozoan infections constitute a significant threat. These infections, primarily including babesiosis, theileriosis, and anaplasmosis, are transmitted mainly through tick vectors and lead to substantial morbidity and mortality in dairy herds, resulting in economic losses due to reduced milk yield, reproductive inefficiency, and mortality. Hemoprotozoan infections are endemic in many parts of India, including the West Coast, due to its humid climate favoring the survival and propagation of tick vectors. Despite advancements in veterinary diagnostics and therapeutics, effective management of these infections remains a challenge due to factors such as emerging drug resistance, lack of awareness among farmers, inadequate control of vectors, and climatic variations affecting disease epidemiology. This project will undertake comprehensive surveillance to map the prevalence and vectors of these diseases. Detailed pathological investigations will clarify disease mechanisms and progression. The study will compare traditional and molecular diagnostic tools to identify the most reliable methods for early detection. Evidence-based treatment regimens and integrated vector control measures will be formulated to minimize disease burden. The outcomes will directly support farmers through improved herd health management, reduced production losses, and informed policy decisions for sustainable dairy farming.

RESEARCH GAPS

Hemoprotozoan infections such as Theileriosis, Babesiosis and Trypanosomiasis are major constraints to dairy production in the west-coast region of India, where warm humid climatic conditions favour the proliferation of vectors such as ticks and biting flies. Despite their economic importance, there is limited systematic information on the prevalence, seasonal dynamics, clinicopathological alterations, and molecular characteristics of these infections in dairy cattle of this region. Existing diagnostic approaches in many field settings rely mainly on conventional microscopy, which often lacks sensitivity for detecting subclinical or carrier animals. Moreover, region-specific data on pathogen diversity, pathological manifestations, and the effectiveness of current therapeutic and management strategies are inadequate. These knowledge and technology gaps hinder the development of effective surveillance and control programs. Therefore, the present project is justified to generate comprehensive data on epidemiology, pathology, and diagnostic approaches for hemoprotozoan infections in dairy cattle of the west-coast region. The project will address key questions such as: What is the prevalence and distribution of major hemoprotozoan infections in dairy cattle across different areas of the west-coast region? What are the characteristic pathological and clinicobiochemical changes associated with these infections? How effective are conventional and molecular diagnostic tools in detecting early and subclinical infections? What management and control strategies can be recommended for reducing disease burden and improving productivity of dairy cattle in the region? These outcomes will support the development of evidence-based surveillance, diagnosis and management strategies for hemoprotozoan diseases in dairy cattle. In view of above, this study is planned to study the prevalence, etiopathology, risk factors, diagnosis and management of hemoportozoan infections in dairy cattle reared under farm and field conditions.

OBJECTIVES

1. To determine the prevalence of major hemoprotozoan infections in dairy cattle reared under farm and field conditions in the west-coast region.
2. To investigate the etiopathology and risk factors for major hemoprotozoan infections in dairy cattle.
3. To assess and recommend effective management and control strategies for the prevention and control of hemoprotozoan infections in dairy cattle.

ACTIVITIES

- Survey of health status of dairy cattle through questionnaire and collection of biological samples from cattle of farm and field situated in west coast region.
- Diagnosis of hemoprotozoa from biological samples using traditional blood smear technique and molecular diagnosis by PCR.
- Estimation of haematological or serum biochemical or serum mineral parameters in affected dairy cattle.
- Pathological studies.
- Analysis of risk factors for reproductive disorders based on season, breed, age, parity, type of

feed and other data.

- Evaluation and planning of effective treatment and control strategies for management of reproductive disorders in dairy cattle.

EXPERIMENTAL DETAILS

Treatment:	NA
Fertilizer Doses	NA
Variety	NA
Replications:	NA
Observations:	Current status of hemoprotozoan infections in dairy cattle will be recorded, consumables required for the study will be procured. The biological samples required for diagnostic and pathological study will be collected Etiological agents for hemoprotozoan infections will be diagnosed Hematological and serum biochemical parameters in healthy and diseased dairy cattle will be estimated Gross and histopathological studies will be correlated with etiological agents Risk factors responsible for hemoprotozoan infections will be determined. Management and control of hemoprotozoan infections in dairy cattle.
GPS Coordinates:	NA

EXPECTED OUTPUT

1. The incidence, etiological agents and risk factors will be determined for hemoprotozoan diseases in dairy cattle reared under farm and field conditions of west-coast region.
2. Based on the study, treatment and control strategies will be formulated for effective management.
3. Scientific publications, reports and extension folders will be prepared for veterinarians and dairy farmers on disease prevention, management and diagnosis.

EXPECTED OUTCOME

Reduced Burden of Hemoprotozoan Diseases. Improved Cattle Health and Productivity. Strengthened Disease Surveillance System. Enhanced Veterinary Diagnostic Capacity. Increased awareness among dairy farmers and field veterinarians about disease prevention and rational treatment approaches. Sustainable Disease Management Practices. Economic Upliftment of Dairy Farmers.

FIELD INFORMATION

When the field was developed:	NA
What are crops being cultivated season-wise:	NA

Soil type:	NA
Soil pH, EC, OC:	NA
Soil depth:	NA
Soil NPK and Micronutrient status:	NA
Common pests and diseases:	Theileria, Babesia and Anaplasma