

# Field cum Laboratory Procedures in Animal Health Care

by  
**Zahoor A. Pampori**

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## Preface

A globally significant role for the Indian livestock system depends critically on India's ability to control and eradicate the animal diseases. Though the livestock sector contributes an estimated 8.4% to the country GDP and 35.85% of the agricultural output, yet livestock diseases are the most important constraints to profitable animal production. Acute infectious diseases on one hand decrease the animal population and chronic diseases on the other hand results in production losses. India contributes about 19% of the world cattle and buffalo population and 20% that of goats besides appreciable proportion of sheep and poultry. India has become highest milk producer in the world. Kashmir division has livestock population of 38 lakh and milk production 290 lakh tons, making 290ml milk available per person per day. Present animal disease scenario has increased the importance and responsibility of a veterinarian in field as well as in laboratory, while demanding reliable and quick disease diagnosis, besides treatment. There are, no doubt, reliable and quick diagnostic tools available in the country but disease diagnosis, while employing them, cannot be achieved from any laboratory unless the relevant and desirable sample is collected, handled, preserved and transported to the diagnostic centre in the best possible manner. It becomes necessary for a veterinarian to know what materials are required to be collected for disease diagnosis and similarly laboratory persons must be aware of the tests/techniques to be employed for an early diagnosis of a disease. Realizing the need and responsibility, this book has been designed to impart the basic knowledge of collection, preservation, transportation of samples required for diagnosis of a disease besides providing preliminary information about the techniques / tests/ procedures employed in the field and laboratory. An attempt has

been made to frame a trace chart of practical guidelines to be followed in the diagnosis of a particular disease. This book also includes physiological profile of various parameters in domestic animals besides tips for better care and management of laboratory animals. I hope this book shall prove valuable for the field veterinarians, laboratories and veterinary students.

In the foremost I offer my heartfelt devotions to Almighty. Help, inspiration and encouragement rendered by Dr. M. M. Ahmad (Director, Animal Husbandry, Kashmir), Dr. N.K. Kuda (Ex. Director), Dr. A. Khan (Joint Director), Dr. A.M. Qureshi (Dy. Director), Dr. Saleem Iqbal (HOD, Vety. Physiology, FVSc.), Dr. A.K. Bhat, Dr. J.L. Matoo, Dr. V.K. Koul, Dr. A.K. Raina, Dr. M. Chesti, Dr. M. Naqati, Dr. F.A. Jan, Dr. K.A. Shah, Dr. M. Shaheen, Dr. M. Saleem, Dr. Neelofer, Dr. Shaista, Mushtaq A. Shah, G.A. Fazli, M. Shafi and M. Ashraf is gratefully acknowledged. I tender my deep sense of regards, love and affection to my parents and dependents for their encouragement and forbearance during my undertaking this piece of work.

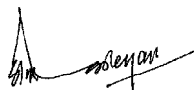
In undertaking this task, errors and omissions are inescapable and I welcome your corrections, comments and suggestions.

**Zahoor A. Pampori**

## Foreword I

Better human health cannot be dreamed of unless animal care is given due attention. The well being of livestock largely depends on better management, early detection of ailment and its effective treatment and control. Even if our livestock population contributes significantly towards the economic development, yet due attention is not being given for their upkeep. In our state farmers have not yet tasted the fruits of available modern techniques/facilities in animal health care. This is probably because of lack of awareness among public as also poor feed back from the field besides lack of expertise in the veterinary field staff. It is perhaps, this subtle feeling and the inspiration of staff of the Institute of Animal Health, Zakura, Srinagar that has made the author, who has been working in the institute, to write the book which contains valuable information about collection, preservation and transportation of test materials, besides a worthy comprehensive table, for arriving at early and definite diagnosis of a disease.

I personally feel delighted to see one of my associates venturing this task and am confident that this book would be helpful to the field veterinary staff as also the laboratory personnel.



**(Dr. N.A. Khan)**  
Joint Director,  
Institute of Animal Health, Zakura

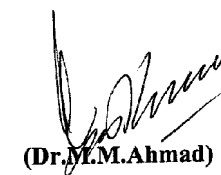
## Foreword II

It is a matter of immense pleasure to have in my hands the manuscript of the book "Field cum Laboratory Procedures in Animal Health Care". The book, a timely and laudable effort by our young veterinary scientist Dr. Z.A. Pampori should serve as a very useful guide to the field and laboratory workers alike.

It is often seen that excellent advanced research/diagnostic facilities cannot realize their full potential because of insufficient, unrelated, or unscrupulously collected, preserved and transported test materials. One of the other factors influencing the ultimate results obtained could be a flaw in the technique employed in the laboratory. This book is an attempt to preclude such possibilities.


I am confident that this book can be used as a guide manual by field veterinarians, paravets, farm owners and managers, diagnostic laboratories and other institutions related to the field of livestock industry and research work.

I congratulate the author for his creative venture and expect him to continue his creative efforts further.



**(Dr. M.M. Ahmad)**  
Director,  
Animal Husbandry Department,  
Kashmir, J&K State

I am sure that this handbook will be of immense value and beneficial to the students, veterinarians and paravets in the disease investigation laboratories, in the biological institutes and in the field.



DR. A.S. BUCHH

Dean/Professor and Head  
Division of Microbiology & Immunology,  
Faculty of Veterinary Sciences and A.H.,  
SKUAST, Kashmir

## From Dean's Desk

In a rapidly developing field of scientific endeavour, technical approaches that are of paramount importance for progress in the field are not static but under go constant change. The impact of new technology associated with these developments has been to create hopes for the diagnosis and control of numerous disorders of livestock including poultry. The careful evaluation of the history and occurrence of multifactorial disease in the laboratory will facilitate appropriate corrective measures. Dr. Z.A. Pampori has done a commendable job in structuring and editing this volume of handbook of *Field cum Laboratory Procedures in Animal Health Care*. The handbook/laboratory manual, has comprehensive coverage on collection, preservation, transportation and processing of the samples/suspected material in the laboratory for disease diagnosis. The author has elucidated the suitable methodologies for washing, sterilization of laboratory wares, collection of material for laboratory diagnosis, handling of suspected material in the laboratory, isolation and identification of bacteria, fungi, viruses and parasites.

The author has included separate chapters on care and management of laboratory animals, production of common livestock and poultry vaccines, physiological profile of different animals, tabular representation of animal diseases, their diagnosis and the trace chart containing valuable information is an added feature of this book.

This book is first of its kind in India on field cum laboratory procedures in animal health care. This book has been composed to impart the basic knowledge of collection, preservation and transportation of test samples required in the diagnosis of a suspected disease. It provides practical guidelines to be followed for reaching the definite diagnosis of a suspected disease. The author has chalked out a unique trace chart providing ready references to different animal diseases, their causative agents, symptoms, test materials required and relevant laboratory tests to be employed for arriving at diagnosis of a disease. This book contains perhaps for the first time, in a tabular form, the morphological, cultural and biochemical characteristics of different disease causative agents. This book also contains valuable information about the care and management of laboratory animals besides physiological profiles of various parameters in domestic animals. This book deals in the basic principles of modern laboratory techniques being employed in animal disease diagnosis. This book also provides guidelines for manufacture of important animal disease vaccines.

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# Chapter 1

## Washing and Sterilization of Laboratory Wares

### 1.1. WASHING

For any laboratory procedure, it is necessary that all kinds of laboratory wares should be clean, dirt, dust and grease free. For microbiological use, laboratory wares must be free from microbes also.

Laboratory wares should be cleaned by a cleansing agent that removes all traces of dirt or dust with no residual precipitation of cleansing agent. Do not use soap. A detergent should be used to clean the wares. Detergent to be used should have qualities like;

1. It should not contain free alkali,
2. It should soften water,
3. It should be quickly and completely soluble in water,
4. It should not precipitate,
5. It should lower the surface tension and easily be rinsed,
6. It should have good wetting quality besides being non-irritant.

The laboratory wares should be soaked for a short time in wash tubs with 1% detergent warm water. Scrubbing of the wares should be done wherever necessary with a brush. The wares should be then rinsed with running warm water or better distilled or deionized water for at least three times. It is advisable to rinse the wares with distil water when in use for microbiology. Washed wares are set on a clean dry surface to drain and dry.

The laboratory wares with agar, jelly or paraffin should be first autoclaved or submerged in large container and then heated to boil. Thereafter, washing is followed as discussed. However, in advanced laboratories there are mechanical washers used for washing different types of laboratory wares.

The used microscopic slides with immersion oil should be first washed with xylol, rinsed with tap water and then immersed in 1:1000 solution of nitric acid for over night, then rinsed thoroughly and dried with tissue paper. New slides should be washed with water and placed in 95% alcohol for 15 minutes and then dried with tissue paper.

After washing and drying, the laboratory wares to be sterilized should be wrapped with brown paper and mouths plugged with cotton plug or corks to ensure maintenance of sterility.

### 1.2. STERILIZATION

Sterilization is a process of destroying germs including spores. Sterilization can be effected in a variety of ways depending upon the nature of material to be sterilized like instruments, laboratory wares, equipments, drugs or culture media etc. The sterilization methods are discussed hereunder.

#### 1.2.a. Heat Sterilization

Heat can be applied for sterilization in two forms, the dry heat and the moist heat.

#### Sterilization by Dry Heat

Sterilization is effected at a temperature of 160 °C for 1 hour or 180°C for 30 minutes that is sufficient to kill most of the resistant spores. Dry heat is believed to kill the organisms by destructive oxidation of essential cell constituents. This type of sterilization is employed for glass wares, metallic wares or other goods which are not spoiled by high temperature and anhydrous fats, oils and powders which are impermeable to moisture.

Inoculating wires, loops, points of forceps are sterilized by keeping them in a burner flame until red hot. Scalpels, needles, mouths of culture tubes, cotton plugs or glass slides are sterilized by passing them through the burner flame with out making them red hot.

The acquisition, care, housing, use, and disposition of nonhuman animals in research must be in compliance with applicable federal, state, and local, laws and regulations, institutional policies, and with international conventions to which the United States is a party. APA members working outside the United States must also follow all applicable laws and regulations of the country in which they conduct research. All procedures carried out on nonhuman animals are to be reviewed by an institutional animal care and use committee (IACUC) to ensure that the procedures are appropriate and humane. Public Health Service policy on the humane care and use of laboratory animals. Bethesda, MD: NIH. Retrieved September 27, 2011.