Summary and Conclusion
Chapter- VI

SUMMARY AND CONCLUSION

The investigation entitled "Studies on ectoparasites (Ticks and Mites) of cows in Rohailkhand area" (U.P.) restricted to ectoparasite was planned and executed in relation to the cow entries in this region. It was realized that a systematic study of the ecto-parasites of cows to check the losses due to them, is urgently warranted for this region.

The perditions role of ecto-parasites mostly comprising ticks and mites is well known in the fields of medicine and veterinary practice. Besides, causing injurious diseases, these parasites act as disease vectors. Enormous economic losses caused in the productivity of animals are mostly motivated through sucking out of blood, deficiency syndromes leading eventually to loss of thriftiness and vigour vis-à-vis reduced potential.

This investigation was therefore, undertaken to identify different ecto-parasites viz. ticks and mites and their relative preponderance in adjoining areas with regard to age groups, management, seasons, cows breeds, colour of coat body parts,
conditions of adult cows and finally recommended on effective prophylactic schedule based on drug efficacy test, applied in view the cow husbandry practices of this regions.

Therefore, the present study was undertaken to study the animals of the organized farms and the farmers cows of different villages including, non-descript, Sahiwal, Red Sindhi, Hariana, Gir, Mewati, Nimari and Deoni cow breeds under the conditions of intensive and semi-intensive management. The cows of villagers although also belong strictly to the specific breed, but mostly found the Deoni breeds at all.

An extensive survey work covering huge cow population, total about 1500 cows of farms and widely distributed individuals cow owners are examined for the presence of tick and mites. The animals of farms are attended for several times. The obtained data are represented in the Tables 1 to 60 and discussed properly in previous chapters.

The present investigations, which constitute an attempt in this regard, are chronologically phased to include the followings:
PHASE - I

In the support of investigations, the meteorological records obtained from IVRI, Itzatnagar, and Bareily, Rohailkhand, throughout the study period during March 2003 to September 2006. The following seasons summer, rainy and winter play an important role in the maintenance of host parasite relationship to another.

The cows observed during study period are about 1500. These belonging to different breeds are distributed within organized and unorganized farms of areas of Rohailkhand (viz., Bareily and Badaun, Saharanpur and Rampur, Etah and Aligarh). The data pertaining and applied for the cows are generally summarized in the tables as below:

1. The occurrence of cows in the organized farms are 1084 while in the farmer's cows are 453.
2. Management conditions are intensive, semi-intensive and farmers conditions.
3. The adjoining area of Bareily, Badaun, Saharanpur Rampur, Etah Aligarh of Rohailkhand.
4. Colours of coat viz. black, brown, white and mixed/calves are 456.
5. Selected body parts are ear, neck, back, belly, legs and thigh.

6. Conditions of adults cows are pregnant, lactating, lactating + pregnant and dry.

7. The breeds of cows are, non-descript, Sahiwal, Hariana, Red Sindhi, Gir, Mewati, Nimari and Deoni.

As indicated above, this phase of the investigation involved a systematic survey of the commonly available Arthropodan parasites and cows that affect them adversely. These included ticks and mites, which were closely examined on the cows of the region under reference.

1. The general distribution of ticks and mites infestation in the cows are of the order of about 30.25%, and 13.38% in the organized farms and 31.79% and 26.05% in the individuals farm, respectively.

2. The overall distribution of ticks and mites are 30.71% and 17.11% in general on cows, respectively.

3. The general occurrence of ticks and mites in different localities are as below:

   ➢ In Bareily district, ticks- 30.76%, and mites- 16.97%,
   ➢ In Saharanpur district, ticks- 30.79% and mites- 17.42%.
   ➢ In the Etah district, ticks- 30.57% and mites- 17.03%
The above data's depicted that the maximum ectoparasites are found in Saharanpur district and other Bareily and Etah are moderately minimum.

4. The distribution of ticks and mites on cows under the influence of different seasons are as below:
   
   - Maximum 34-37% of ticks found in winter season and minimum incidence of ticks 26-28% in the summer season. Highest mites infestation are recorded 26-27% in winter, while minimum records are 10-12% in summer, but rainy season is found intermediate with 12-14% of occurrence.
   
   - The distributions of ticks throughout the year are also not uniform like the other parasites.

5. With regard to their age the adult cows have almost low parasitic infestation than the calves in both, organized and unorganized farms.

6. The intensity of various parasites on the adult cows with regards to their conditions are as follows:
   
   - The dry individuals have maximum infestation 34.38%, and 34.48% of ticks and mites respectively. While lactating cows are always minimum infested by these ecto-parasites.

7. Colourwise distribution of ecto-parasites that is the highest 19.85% of mite infestation is recorded in the mixed colour cows. White coloured cows have minimum 8.97% of
mites infestation, with regards to ticks highest incidence are found in black and white cows while mixed colour and black colour have lowest incidence of infestation for ticks.

8. Distribution of ecto-parasites according to breed-wise. In general, the adults of non-descript, Sahiwal, Hariana, Red Sindhi, Gir, Mewati, Nimari and Deoni breeds have 28.58% ticks and 18.04% mites infestation, while those in the group of calves have ticks 35.75% and mites 14.91% attack. These are depicted that the adults suffer much by tick while the calves have also tick attack more than the other groups of parasites.

9. With regards to different body parts of cows, the maximum 35.28% of tick infestation are found on the ears, while other body parts viz., belly, thigh, neck, legs and back are 20.39%, 18.77%, 11.00%, 10.03% and 4.53% found in decreasing order, respectively in adult individuals.

➢ In the case of calves also the distribution of parasite on the host body is similar to the patterns of adults. With regards to the distribution of mites on different body parts of cows, the belly in both of groups has maximum incidence of 53.85% and 55.88% in adults and calves, respectively, while other are minimum infected.

➢ The distributions of ticks on the adult and calves body parts are as follows. In the adult cows belly and neck have
respectively higher and legs has very lowest infestation while other body parts were moderately. While in the calves also belly has maximum infected while the legs and thigh have minimum infected by ticks.

➢ The visiting of parasites are also not uniform on the host body. The legs and belly particularly are visited more than the other part of the body in the both groups of cows viz. adults and claves. Rest of the body parts have incidence of parasites infestation in between. It is also seen that the parasites attack during morning and evening and almost all the time of the day.

10. With regards to body weight of calves has been found that the maximum occurrence of ticks and mites observed on the high body weight, medium body weight and low body weight of calves are 29.23%, 19.46%, 6.15% respectively. The minimum parasitic occurrence is found on the calves of low body weight.

11. It has also been observed that the weak individuals have maximum incidence of ticks and mites in all groups of cows. While the healthy individuals have always lowest and normal individuals are moderately infected by parasites.
PHASE - II

CONTROL MEASURES

The acaricides/insecticides used against the parasites are DDT + dust, Malathion, Aldrin, Sulphur, Sevelon, Himax and Ascabiol. These drugs were prepared in different concentration and used systematically. The efficacy of all drugs formulations are summarized herewith their concentrations as follows:

1. Acaricides/insecticides used in 3%, 5% and 10% concentration of DDT + dust, 5%, 10% and 15% concentration of Malathion and 10%, 15% and 25% concentration were used for the controlling of ticks as dust form. Malathion and Aldrin responded better in almost all concentrations, but these were seen most effective in 10%, 15% and 25% concentration of DDT + dust, Malathion and Aldrin, respectively, because all the ticks were removed within 24 hours from the treated animal. The parasites, however, reappeared after one or two week of the treatment.

2. Same drugs used as dust formulations were also applied on host body in the form of Wettable powder for the controlling to ticks. These drugs are DDT + dust, Malathion and Aldrin used in the concentration of 25%, 30%, 35% and 40%. The observations were made during and after the application and it was found that the effectiveness of insecticides/acaricides
increased with increase of concentration. Among these three acaricides/insecticides used, Aldrin was most effective against ticks, while DDT was least. The ticks were completely removed within 24 hours. But some cows were reinfected after few days of treatment.

3. Different acaricides/insecticides used as wash for the control of cattle ticks viz. DDT (25% EC), Malathion (50% EC), Aldrin (30% EC) and Sevelon (50% EC) were prepared in water in three concentrations of each drug. These are 0.025%, 0.05% and 0.1% of DDT (25% EC), 0.75%, 1.0% and 2.0% concentration of Malathion (50% EC), 0.5%, 1.0% and 2.0% of Aldrin (30% EC) and Sevelon 0.1% and 0.3% concentration used against ticks. The 2.5% Aldrin and 0.3% Sevelon of almost 100% effectiveness for longer residual effect in the removal of ticks. However, all the concentrations of all drugs showed increasing in order effectiveness on infesting parasite and Aldrin 2.5% and Sevelon 0.3% definitely removed to parasite from the host body with in 24 hours. The ticks were always found to be more resistant to drugs than the mites.

4. Acaricides used as lotions for the controlling of mites on the host body. Mainly three lotions viz., sulphur + Vasline, Himax and Ascabiol were used against mites in cows addition to water alone as control group. The sulphur + Vasline gave
good results against mite when it was applied without water. As against this, Himax gave satisfactory results, applied on affected parts. Ascabiol on the other hand gave better results with hot water and also without water. Control group water treated as wash continued to remain infected with mites and showed regular increase of the mite infected areas on the host body. The water alone could not provide any kind of curable effect against mites.

Ticks and mites can detect the high concentrations of these drugs in doses and they avoid them. But, when the low concentration of drugs used, they could not be detected in the doses, to which they were attracted cow-sheds to relieve them of the resistance of ticks and mites.

It is concluded that the arthropodan parasites do not owing problem in the cow husbandry practices in the region under reference. They are, however, relatively more often seen with the intensively managed large herds than the extensively managed ones in small numbers.