Livestock & Dairy Development Department
Government of the Punjab

Surveillance and Prophylactic Measures against Camel Diseases in Punjab

MID-TERM REPORT

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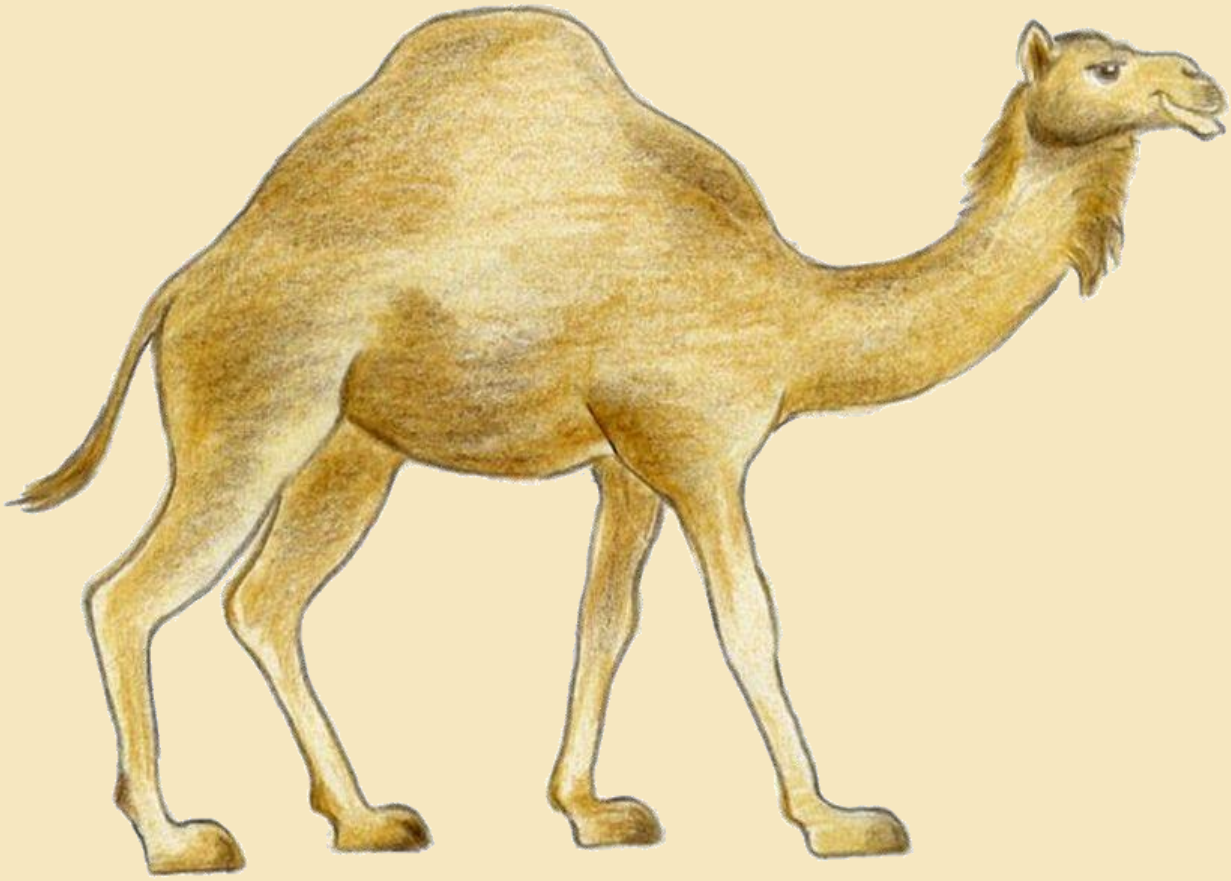
اَفَلَا يَنْظُرُوْنَ اِلَى الْاِبِلِ كَيْفَ خُلِقَتْ ﴿١٧﴾

Al Ghaashiya (88:17)

یہ لوگ اونٹوں کی طرف نہیں دیکھتے کہ کیسے (عجیب) پیدا کیے گئے ہیں

Do they not look at the Camels, how they are made?-



DEDICATION

To the camel herders who live out in scorching desert heat with the camels that they tend, in a very primitive and simple living arrangements

FOREWORD

Of all the animals mentioned in the Quran – dogs, horses, birds, locusts, etc – Allah picked the camel as the one we should reflect upon.

Why do they not reflect on the camels and how they are created?
Al Ghaashiya (88:17)

The camel is absolutely perfect for what it needs to do and where it needs to survive. All of the camel is practical for its survival and for its service to man. In most neglected areas of the Punjab, like Cholistan, Thal, and Tribal Area of Dera Ghazi Khan Division, camel is a linchpin in the mod cons free life of most marginalized communities. Life and livelihood of these communities, to a greater or lesser extent, depends upon camel. The efforts of Livestock & Dairy Development Department (L&DDD) are commendable as they embarked upon an active surveillance to determine the status of parasitism, brucellosis, and sub-clinical mastitis in this neglected species. The work done for the health and productivity of camel would definitely reciprocate in the socio-economic uplift of poor communities living in hilly and sandy terrains of the Punjab. What Allah has directed in the Quran L&DDD Punjab is furnishing through this Project.

I congratulate Mr. Naseem Sadiq, Secretary to Government of the Punjab, L&DDD and his team for conducting first ever serious and earnest work for the welfare of camel farming communities of the Punjab. L&DDD Punjab through this Project, has set an example for the other Provinces to follow.

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PREFACE

For a long time, without exaggeration, the camel has been the most ignored among the domestic ruminants in Pakistan. During the past few years, resurgence of interest in this species has been witnessed in the national and international markets of the world regarding its milk and meat. The Punjab Government realized this emerging global demand/ trend for camels and the products thereof and envisioned the Project titled, "Prophylactic measures and sero-surveillance of camel and camel milk processing in Punjab". The core objective was to improve the production and productivity of camels through improved diagnostics, surveillance, and provision of gratis veterinary care at the door step of camel herders. Gratis deworming and anti-ectoparasitic campaigns are the hallmarks of this Project.

After lapse of more than one year, mid-term review to assess the interim outputs of the interventions is made. This report presents the interim implications of all the interventions being done under the banner of the Project. At the end of the report some guidelines are advised by the authors for the avid network of diagnostic laboratories of L&DD Department to proceed further under the umbrella of the Project.

January 2017

Naseem Sadiq
Secretary Livestock

TABLE OF CONTENTS

EXECUTIVE SUMMARY

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Camel is an important multi-purpose animal that caters the socio-economic needs of the inhabitants of deserts, mountainous regions and even the irrigated plains of Pakistan, as being their sole bread winner. The production and productivity of camels are at stake because of parasitism, sub-clinical mastitis, brucellosis, and malnutrition. The worthy Secretary realized the agony of these neglected poor animals and envisioned to safeguard their health through the Project titled, "Prophylactic measures and sero-surveillance of camel and camel milk processing in Punjab". This report highlights the progress of interventions being done under the banner of the Project for the mid-term review. Based on the dataset of first year, the overall prevalence of endo-parasites in camels was 71.18%. The prevalence of nematodes, trematodes, cestodes, coccidian protozoan, and mixed infestation were 50.33%, 8.54%, 7.54%, 4.31%, and 0.46%, respectively. The overall prevalence of blood parasites was recorded to be 15%. The highest prevalence was of Trypanosoma (7.91%) followed in order by Anaplasma (3.18%) and Babesia (2.47%). The overall prevalence of brucellosis and sub-clinical mastitis among camels was 1.44% and 16%, respectively.

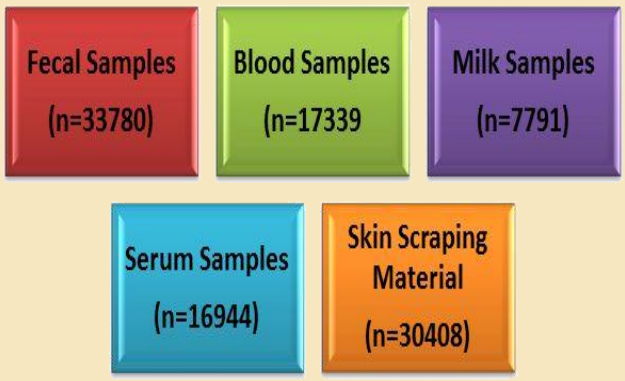
INTRODUCTION

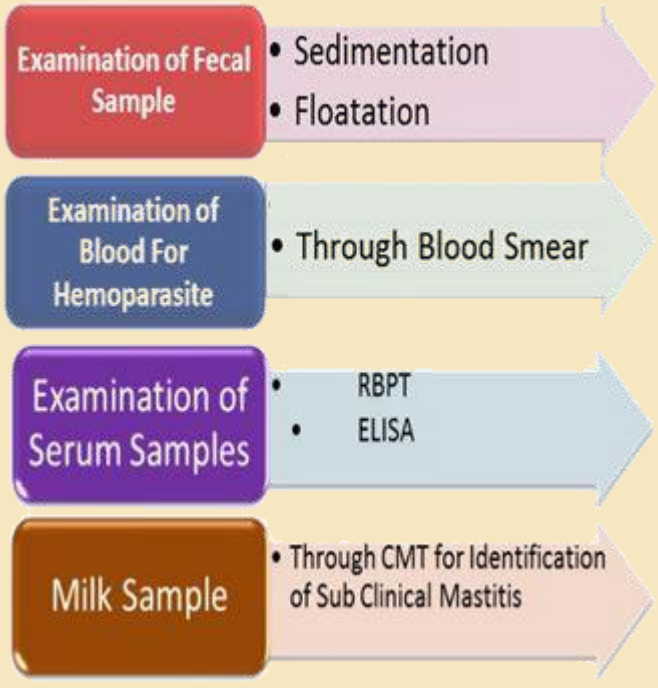
In Pakistan, camels are mainly kept by the inhabitants of deserts, mountainous regions, irrigated plains, and nomadic pastoralists in subsistence production systems of the arid and semi-arid regions (Iqbal *et al*., 2012; Jasra and Isani, 2000; Khan *et al*., 2003; Ahmad *et al*., 2010; Samara *et al*., 2012; Pasha *et al*., 2012). There are about 0.328 million households linked one way or the other with camel production in Pakistan (Anonymous, 2008-2009). Camel can survive and reproduce under a management system with low inputs, harsh environmental conditions and difficult landscapes in arid and semi-arid regions where survival of other animals is usually at risk (Schwartz, 1992). In addition to being a pack and draft animal, the camel is a good source of milk, meat and hides for the residents of the extreme desert areas. The camel milk is sold in small quantities and is also given away or shared with neighbors. The major importance of camel milk is its availability in dry seasons and during times of drought when milk from other livestock is inadequate. The dairy potential of camels appears to be higher than that of cows reared under the same climatic and

management conditions (Faye, 2005). The milk yield ranges between 900 and 4000 L in one lactation period (250-500 days). The camel meat is largely consumed by the people of rural and remote areas of Pakistan, as most of the people of cities have not developed the taste for it. The trend of milk consumption is going to be changed with time due to awareness of the people living in the cities about the medicinal importance of camel milk (Khan *et al*., 2003; Khan, 2012; Sazmand *et al*., 2012). According to an estimate over 798,000 tons of milk is being produced annually in Pakistan (Anonymous, 2008-2009). The trend of slaughtering camels on *Eid-ul-Azha* (the great feast when people slaughter animals in large numbers) is increasing steadily. Being sole bread winner for the, and productivity is at stake because of parasitism, sub-clinical mastitis, and brucellosis. The worthy Secretary realized the agony of this neglected poor animal and envisioned to safeguard its health through the Project titled, "Prophylactic measures and sero-surveillance of camel and camel milk processing in Punjab". This report highlights the progress of interventions being done under the banner of the Project as a mid-term review.

SURVEILLANCE PROTOCOLS

In order to identify the camel's health issues, an active surveillance was conducted in selected 18 district of Punjab with a reasonable number of camel populations. These include Bahawalpur, Bahawalnagar, Rahim Yar Khan, Rajan Pur, Dera Ghazi Khan, Muzaffargarh, Layyah, Lodhran, Bhakkar, Khushab, Sargodha, Mianwali, Faisalabad, Toba Tek Singh, Jhang, Chiniot, Attock, and Jhelum. For this purpose, the fecal samples, blood samples, serum samples, milk samples and skin scraping samples/ ecto-parasites were collected from camels to gauge the prevalence of endo-parasites, blood parasites, brucellosis, sub-clinical mastitis, and ecto-parasites, respectively. The 18



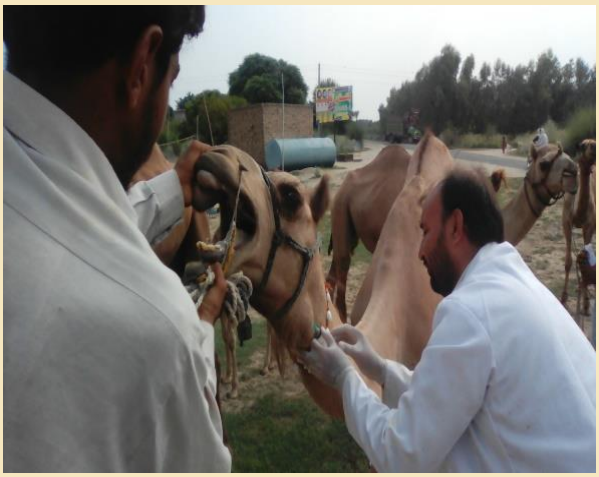


Districts were further grouped into three zones as; Southern Punjab, Central Punjab and Northern Punjab.

Northern Punjab	Central Punjab	Southern Punjab
• Attock	• Faisalabad	• Rajan Pur
• Jhelum	• T. T. Singh	• D.G. Khan
• Mianwali	• Jhang	• Layyah
• Khushab	• Chiniot	• Muzaffargarh
• Sargodha	• Bhakkar	• Lodhran
		• R. Y. Khan
		• Bahawalnagar
		• Bahawalpur

PROJECT OUTPUT

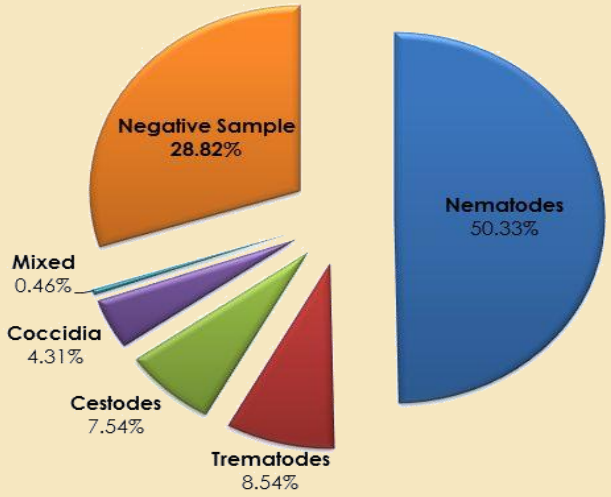
For the surveillance of camel diseases under the banner of the Project, a total of 24045 (71.2%) camels were found positive for endo-parasites, 2606 (7.7%) for hemo-parasites, 245 (0.7%) samples for Brucella, 1264 (3.7%) for sub-clinical mastitis and 24499 (80.56%) for ecto-parasites in camels.



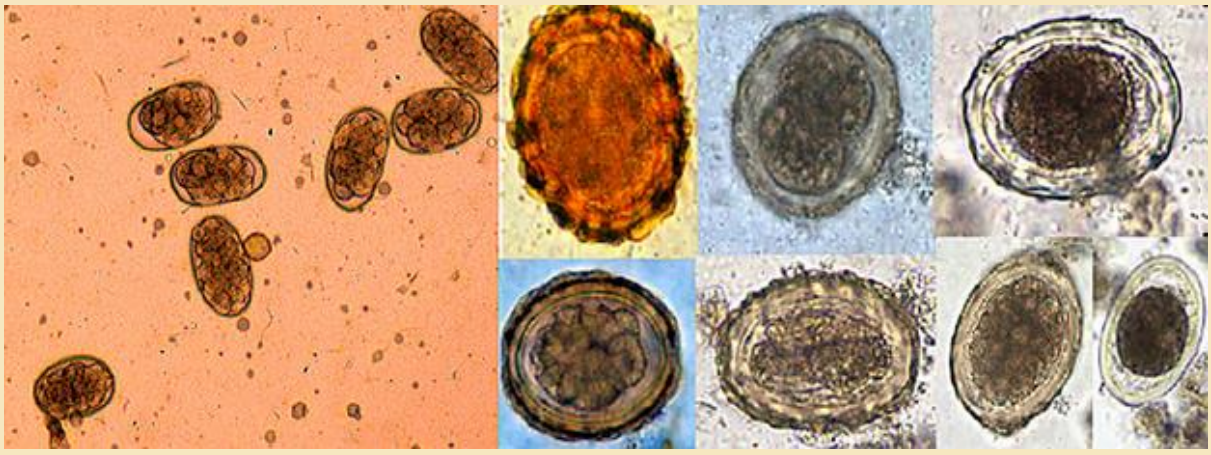
ENDO-PARASITES

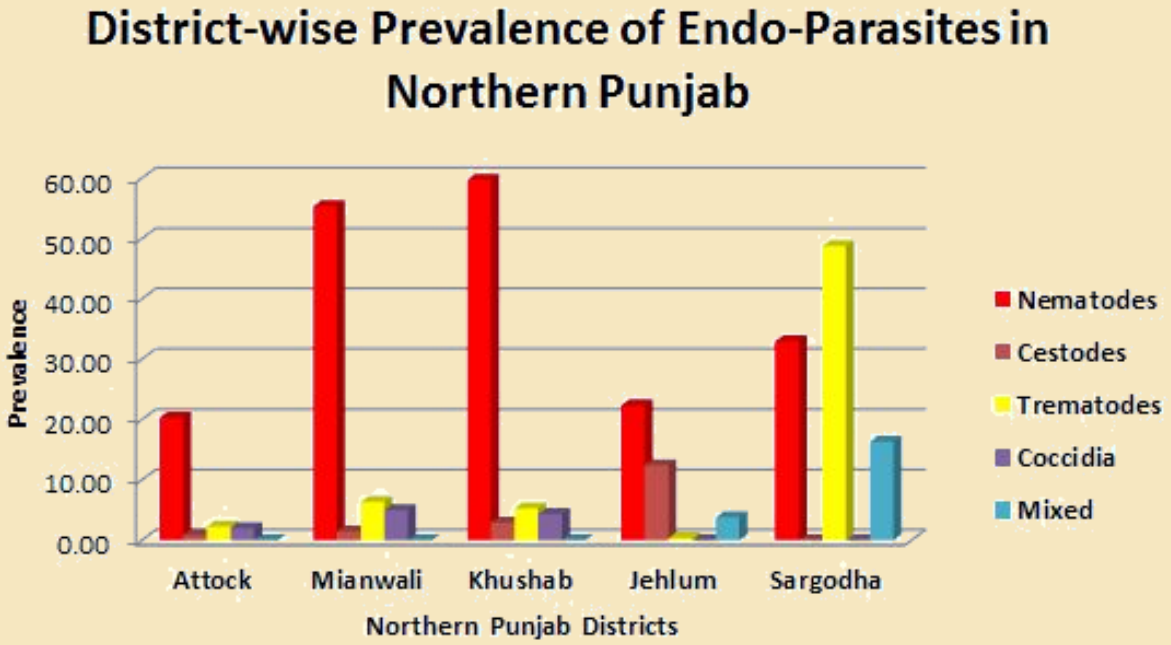
A total of 33780 fecal samples were collected out which 24045 (71.2%) were positive for endo-parasite. The overall prevalence of endo-parasites in camels was 71.18%. The detailed point to point prevalence of endo-parasites is given below:

Point Prevalence of Endo-Parasites of Camel in PUNJAB

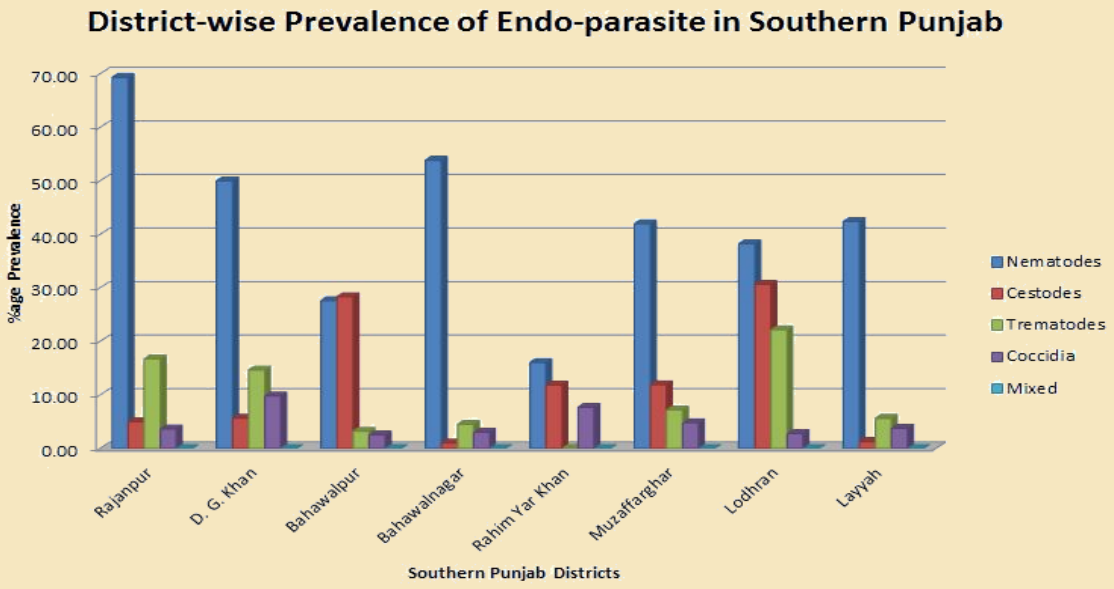


The prevalence of nematodes was 50.33%, followed in order by trematodes (8.54%), cestodes (7.54%), and coccidian protozoan (4.31%) whereas the mixed infestation of endo-parasites was 0.46% in camels.



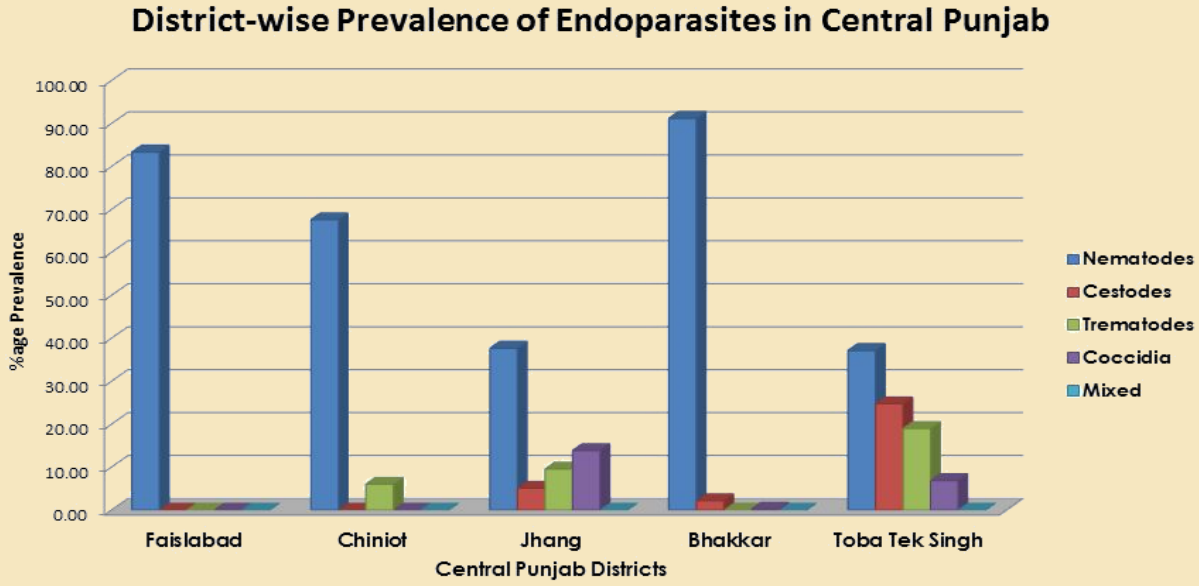


The results showed that in Northern Punjab the highest prevalence of nematodes was in district Khushab (59.75%) followed in order by districts Mianwali (55.39%), Sargodha (33%), Jhelum (22.38%) and Attock (20.31%); whereas the highest prevalence of trematodes (48.78%) and cestodes (12.48%) was recorded in Sargodha and Jhelum districts, respectively. The highest mixed infestation of endo-parasites was recorded only in Sargodha (16.36%) and Jehlum (3.81%) districts of Northern Punjab.



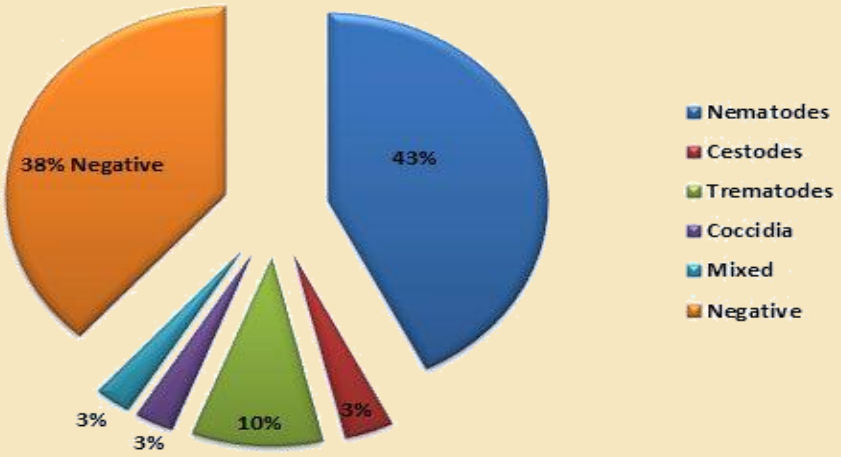
This chart indicates that the highest prevalence of nematodes was recorded in District Rajanpur (69.32%), followed by district

Bahawalnagar (53.86%), D. G. Khan (50%), Layyah (42.40%), Muzaffarghar (41.97%), Lodhran (38.25%) and Bahawalpur (27.63%). The highest prevalence of cestodes was found in district Lodhran (30.66%) followed by district Bahawalpur (28.34%). The highest prevalence of trematodes was also found in district Lodhran (22.19%) followed by district Rajanpur (16.76%) and D. G. Khan (14.66%).

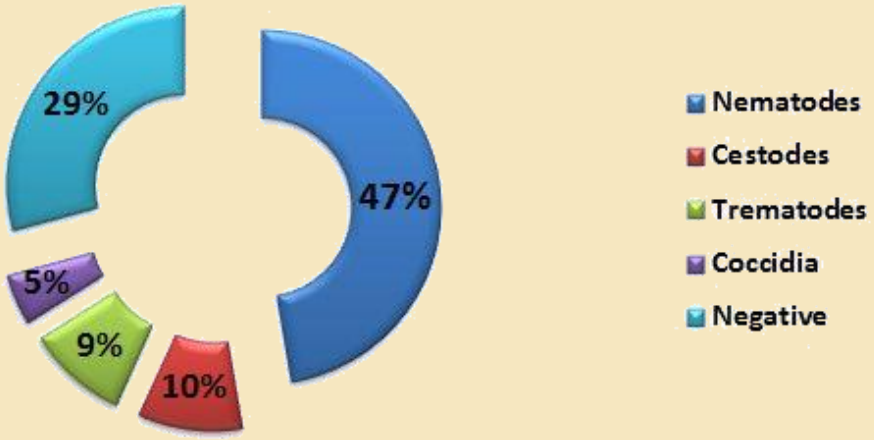


This chart show the highest prevalence of nematodes in district Bhakkar (91.24%) followed in order by districts Faislabad (83.41%), Chiniot (67.64%), Jhang (37.72%) and Toba Tek Singh (37.19%). Both Cestodes and Trematodes were prevalent in district Toba Tek Singh at higher rates i.e. 24.79% & 19.01%, respectively; whereas the coccidian protozoan was found at higher rate (13.91%) in district Jhang followed by district Toba Tek Singh (6.89%).

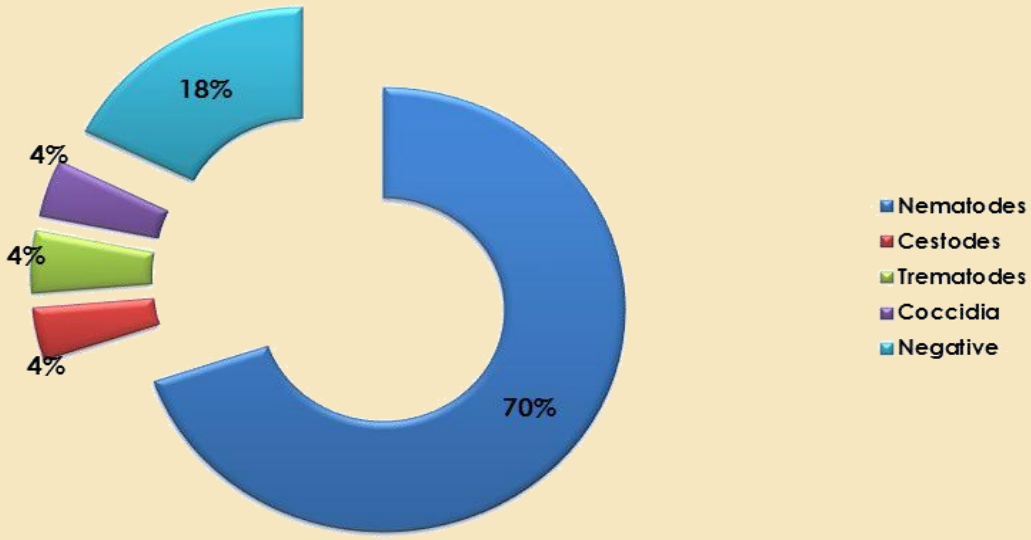
Endoparasites in Northern Punjab



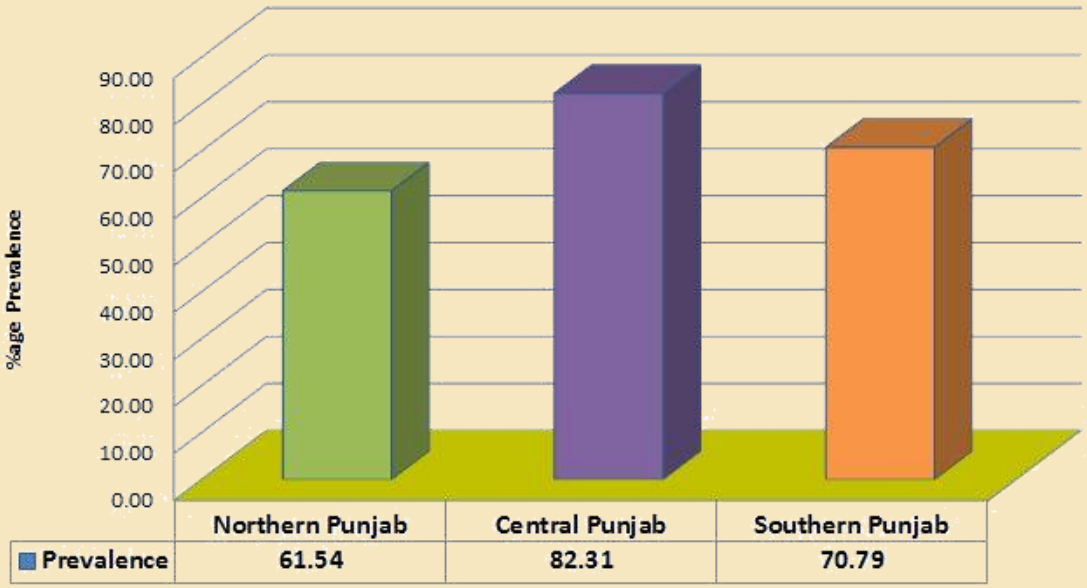
Species-wise Prevalence of Endoparasite Southern Punjab



Species-wise Prevalence of Endoparasites in Central Punjab



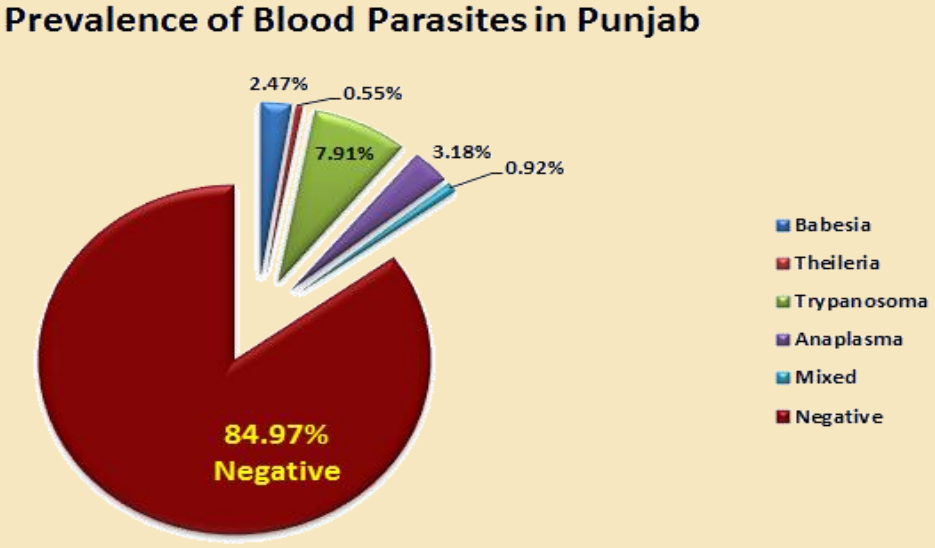
Geographical Distribution of Endoparasites in Punjab



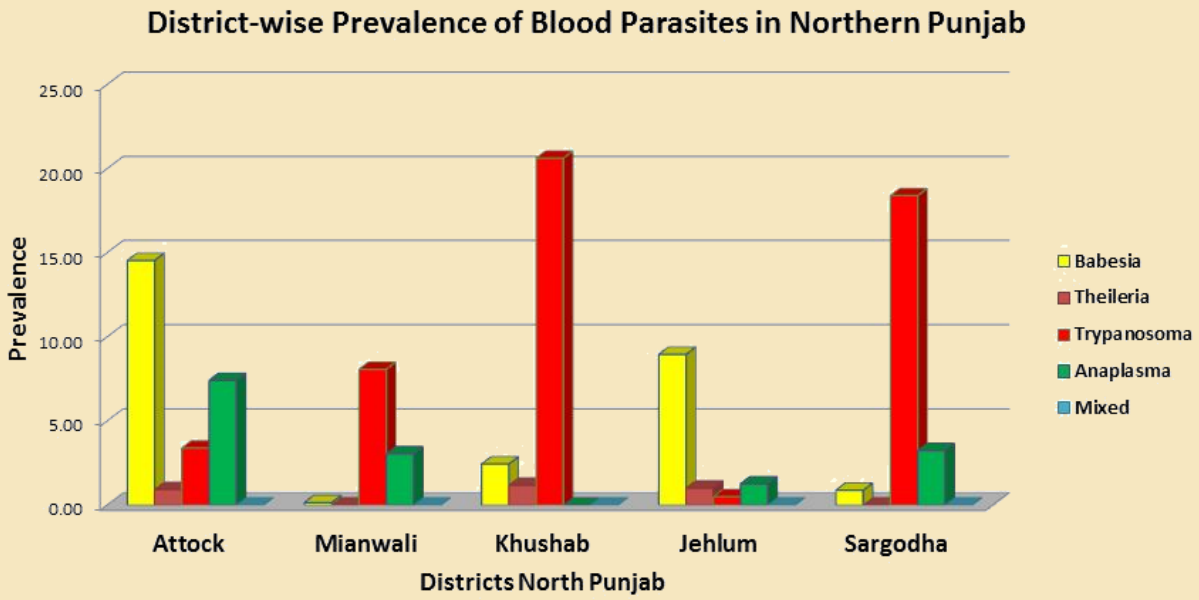
The above chart indicates the highest prevalence of endo-parasites (82.31%) was in Central Punjab followed by in Southern Punjab (70.79%) and Northern Punjab (61.54%).

Hemo-parasites

A total of 17339 blood samples were processed in Laboratories of 18 defined districts. Out of these, 2606 (15%) samples were found positive for hemo-parasites. The point to point prevalence of blood parasites in camels all over the Punjab is shown in figure below:

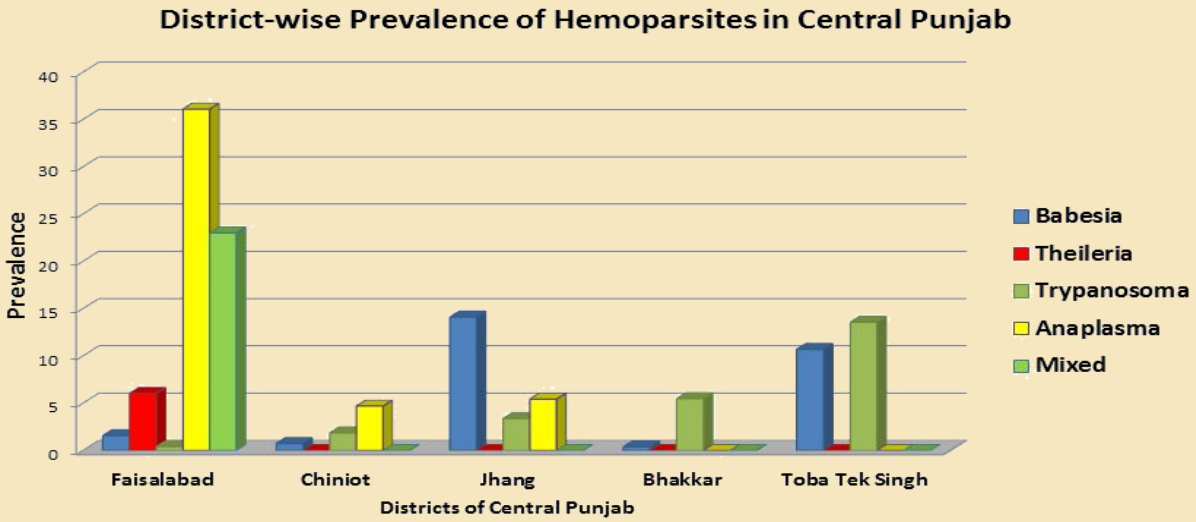


The results showed the highest prevalence of Trypanosoma in camels i.e. 7.91% followed by anaplasma (3.18%) and Babesia (2.47%) in Punjab.

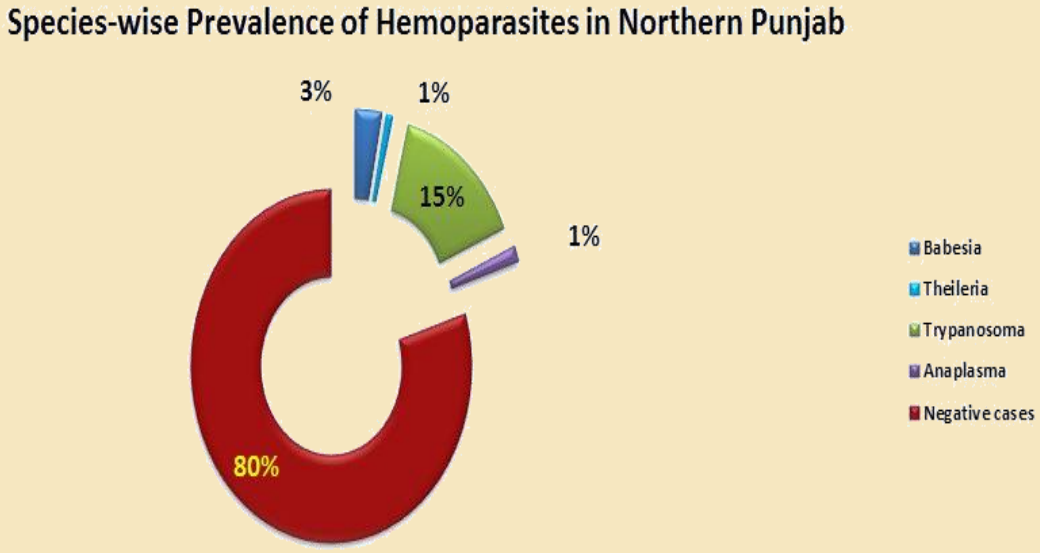


The above chart shows the highest prevalence of Trypanosoma (20.63%) in district Khushab followed by district Sargodha (18.40%). The highest prevalence of Babesia was found in district Attock (14.55%) followed by district Jehlum (8.97%). The highest prevalence of Anaplasma (7.43%) was reported in district Attock.

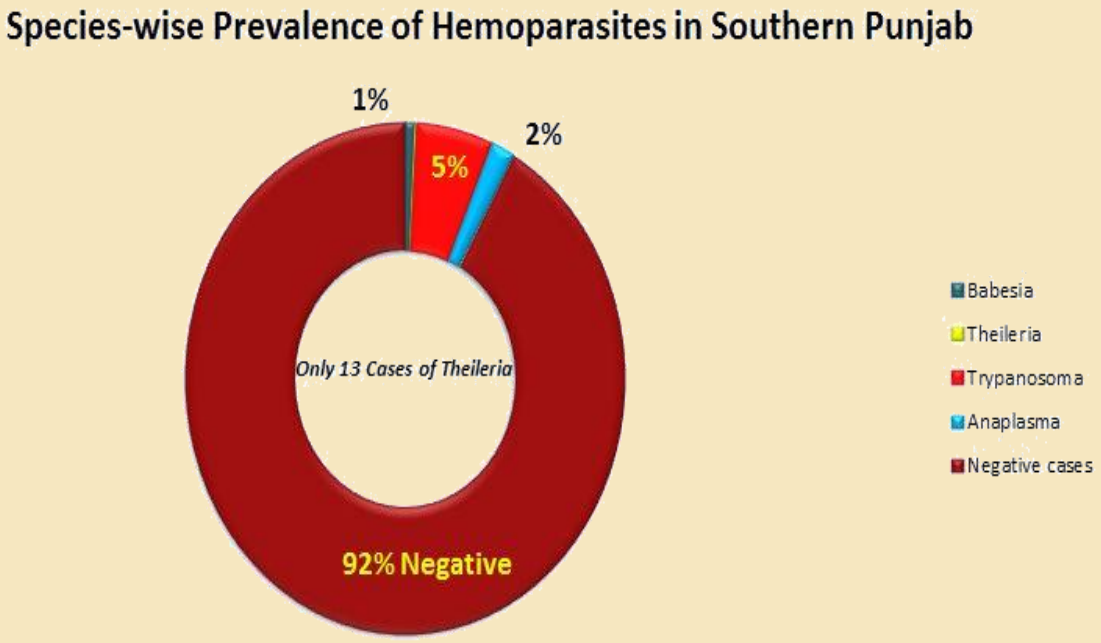
The highest prevalence of Trypanosoma i.e. 13.51% was recorded in district Muzaffargarh followed by district Bahawalpur (6.31%) and Lodhran (6.25%). The highest prevalence for babesia was also recorded in district Muzaffargarh i.e. 3.26%. The chart reveals the highest prevalence of Anaplasma (5%) in district Bahawalpur of Southern Punjab. Moreover, the Theileria was only prevalent in District Lodhran (1.04%) and Bahawalpur (0.51%).



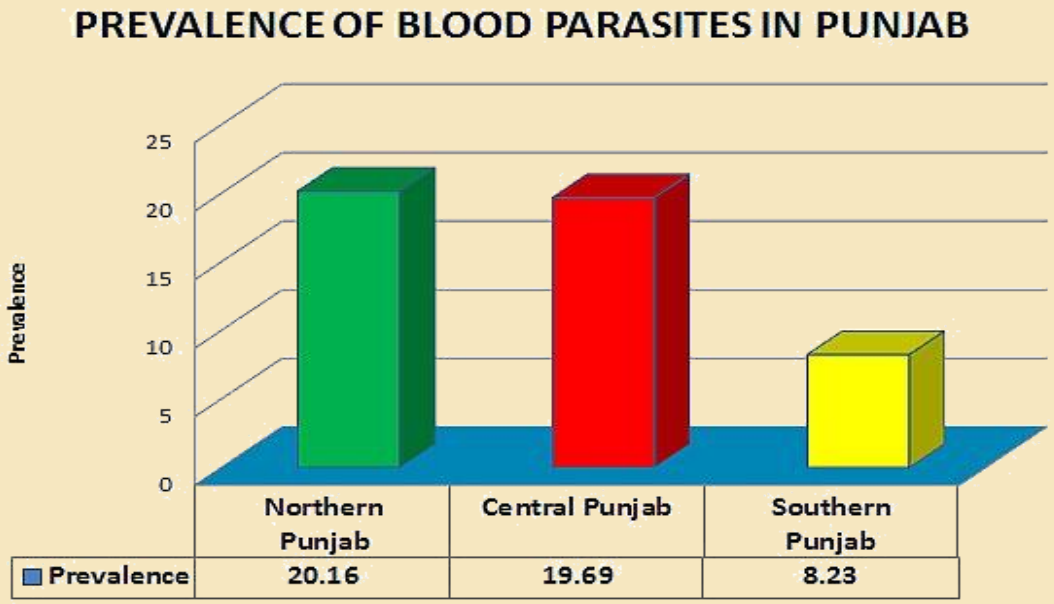
The above chart shows that the highest Prevalence of Anaplasma (36.11%) was recorded in district Faisalabad followed by Jhang (5.44%) and Chiniot (4.70%). The highest prevalence of Babesia was recorded in district Jhang (14.11%) followed by district Toba Tek Singh (10.71%). Moreover, the chart reveals that the Trypanosoma was also found at high rate in camel population of district Toba Tek Singh (13.57%) followed by district Bhakkar (5.50%) and Jhang (3.39%).



The above chart showed the Highest Prevalence of Trypanosoma (15%) in North Punjab.



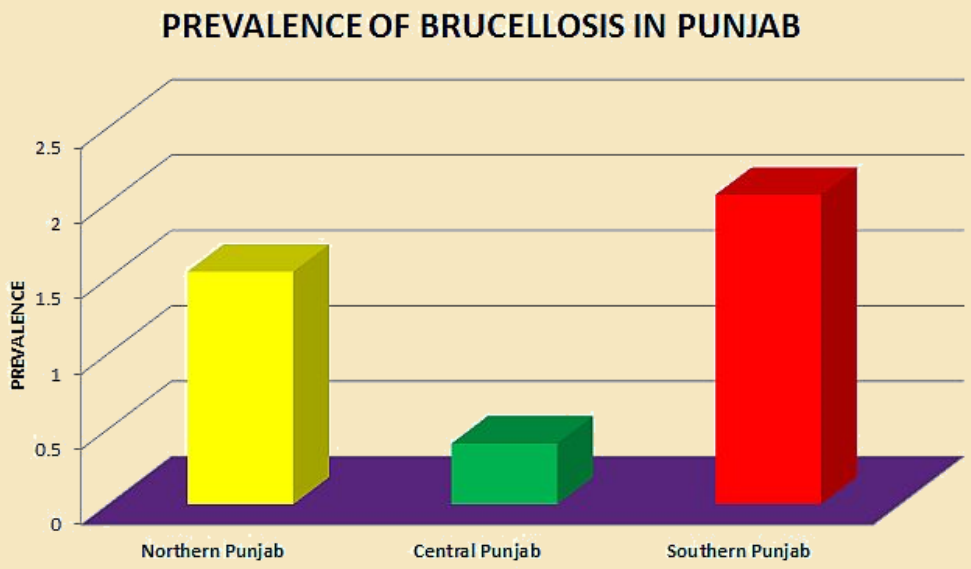
The above chart shows that only 5% cases of Trypanosoma were present in Southern Punjab.



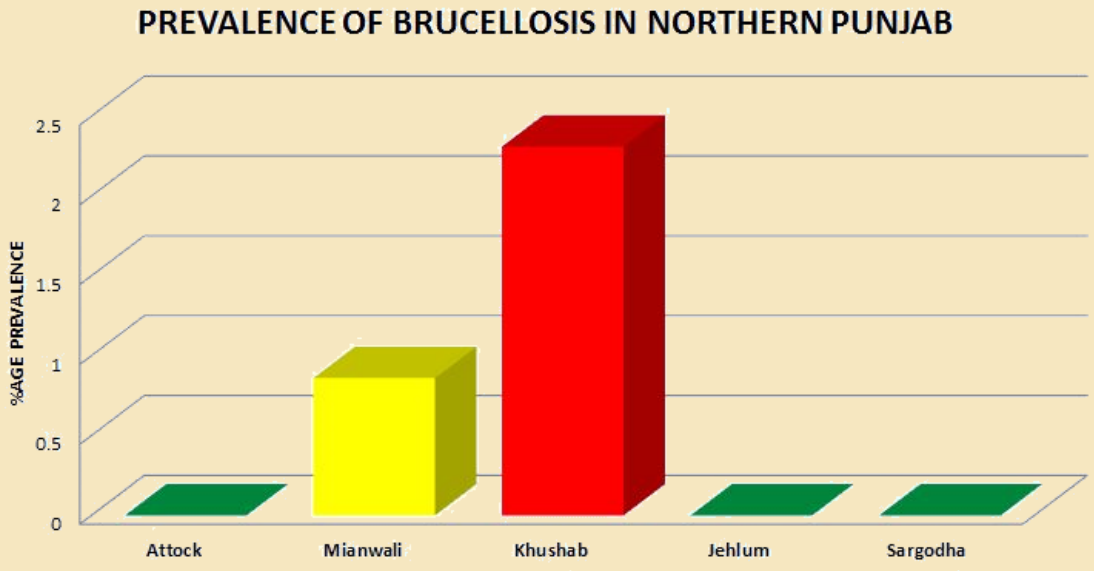
The above chart shows the highest prevalence of blood parasite i.e. 20.16% in Northern Punjab followed by Central Punjab (19.69%) and Southern Punjab (8.23%).

BRUCELLOSIS

A total of 16944 serum samples of camels from 18 districts of Punjab were collected and analyzed for Brucellosis prevalence through Rose Bengal Plate Agglutination Test (RBPT). Out of the total, 245 (1.45%) samples were found positive for Brucellosis.



The above chart indicates the highest overall prevalence of brucellosis was in camels of South Punjab (2.05%) followed by North Punjab (1.54%) and Central Punjab (0.40%).



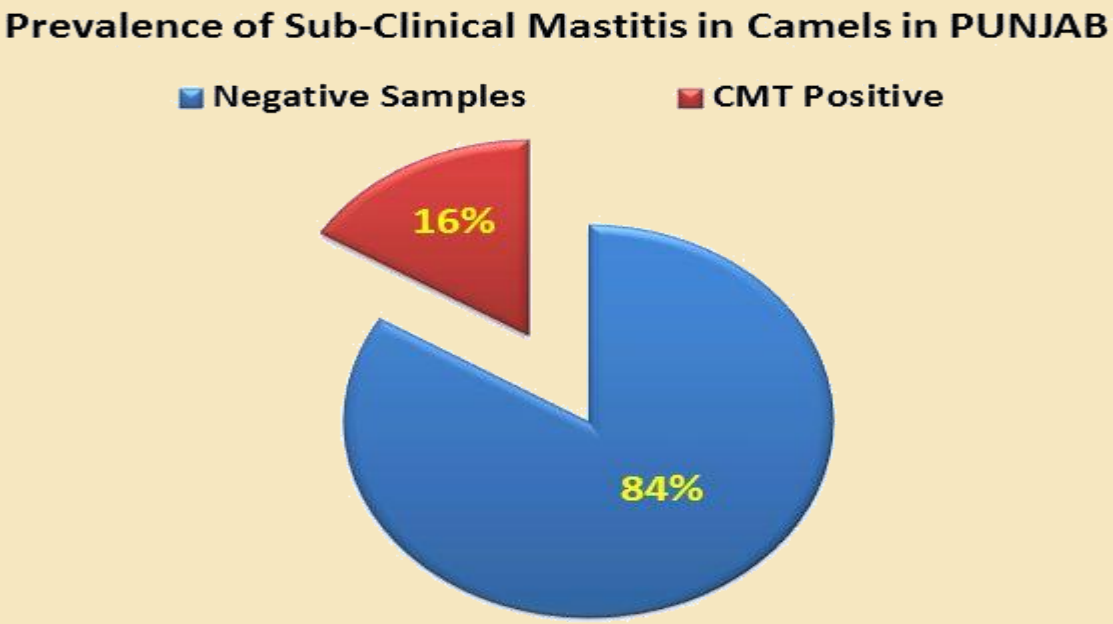
The above chart shows the prevalence of Brucellosis in districts of Northern Punjab. The results show the highest prevalence of

Brucellosis (2.31%) in district Khushab followed by 0.86% in district Mianwali.

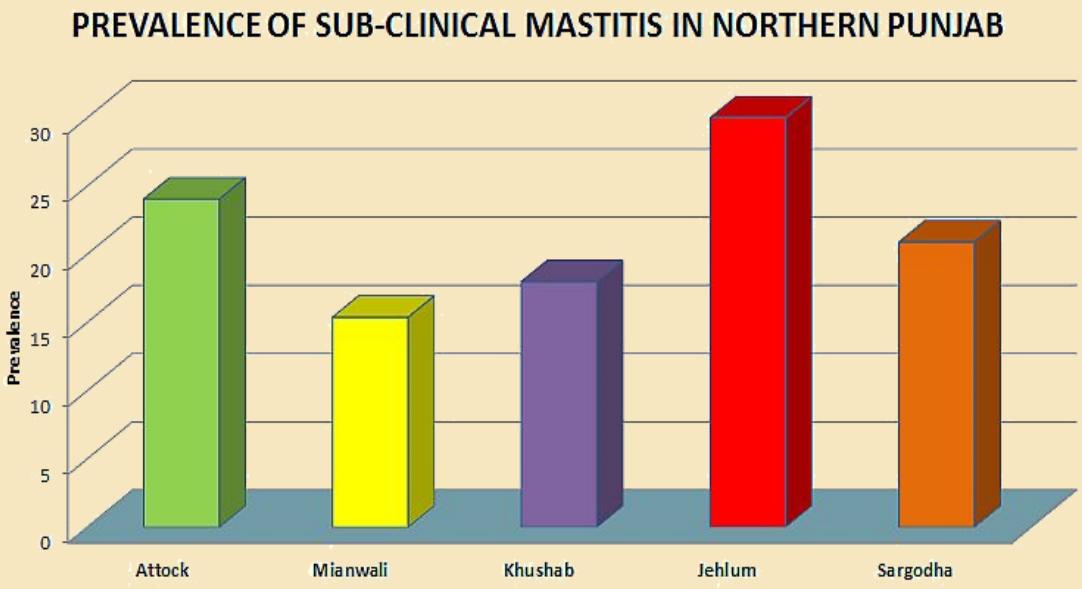

RG
RAHUL GAUTAM
PHOTOGRAPHY

SUB-CLINICAL MASTITIS

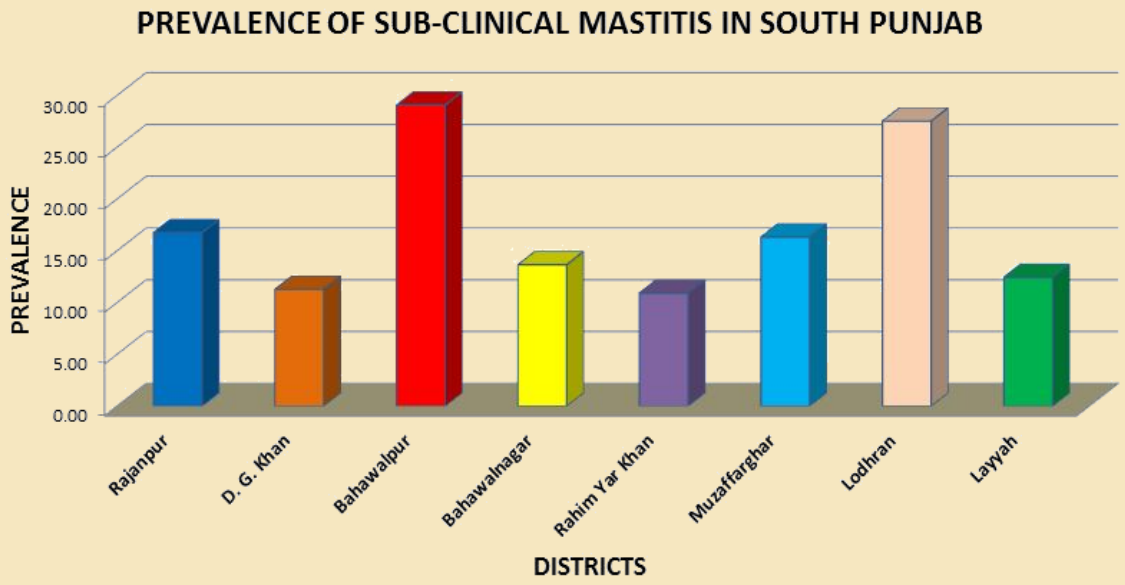
A total of 7791 milk samples were examined out of which 1264 (16%) were positive for sub-clinical mastitis. The milk samples were tested in field through California Mastitis Test. The prevalence of Sub-clinical Mastitis in camels is given below:



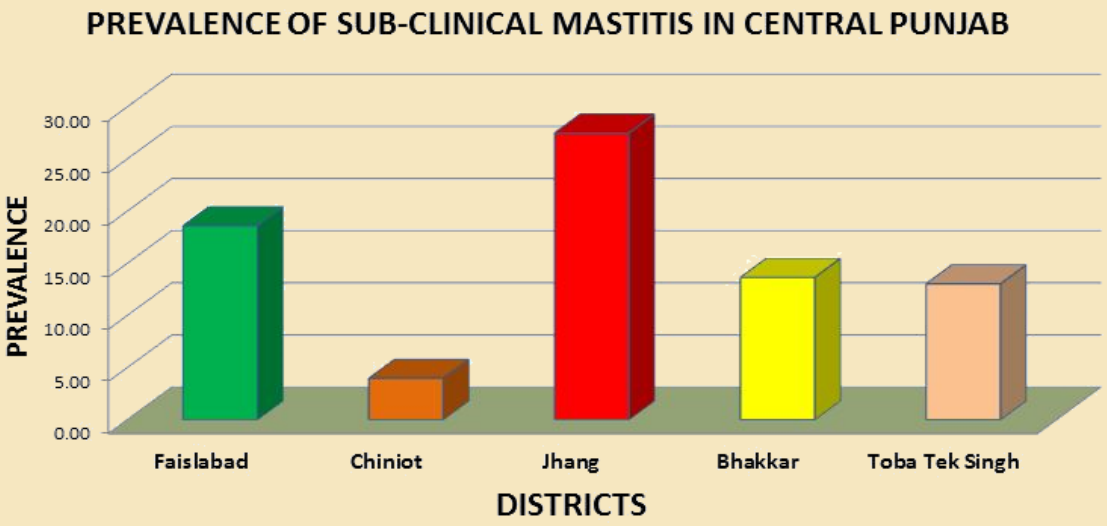
The result showed that the prevalence of sub clinical mastitis in camels was 16%.



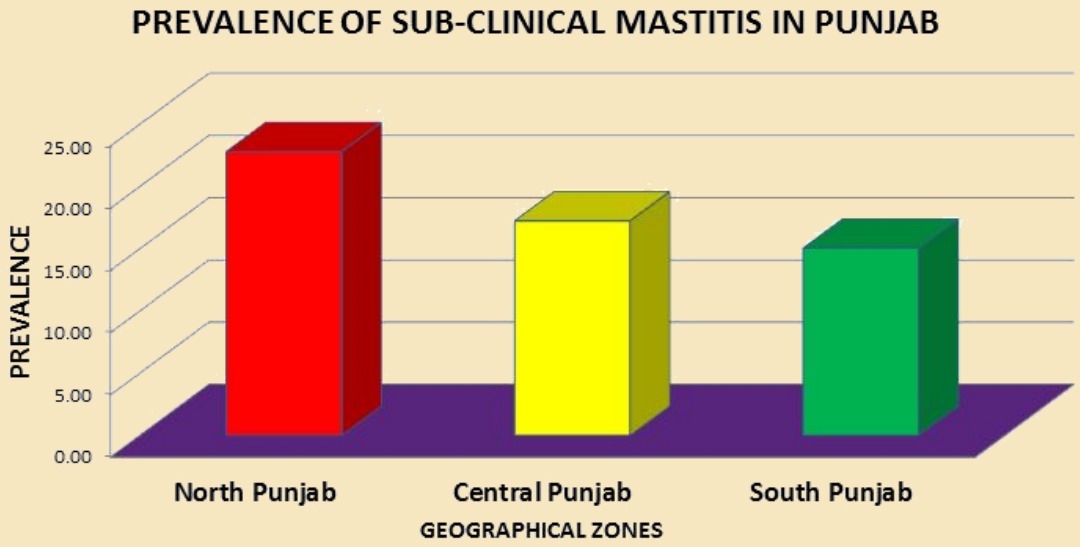
The above chart shows the highest prevalence of Sub-clinical mastitis in district Jehlum (30%) followed by Attock (24.05%), Sagodha (20.90%), Khushab (18%) and Mianwali (15.38%).



The above chart indicates the highest prevalence of sub-clinical mastitis in district Bahawalpur i.e. 29.06% followed by Lodhran (27.52%), Rajanpur (16.75%), Muzaffargarh (16.33%), Bahawalnagar (13.65%), Layyah (12.45%), D. G. Khan (11.28%) and Rahim Yar Khan (10.92%).



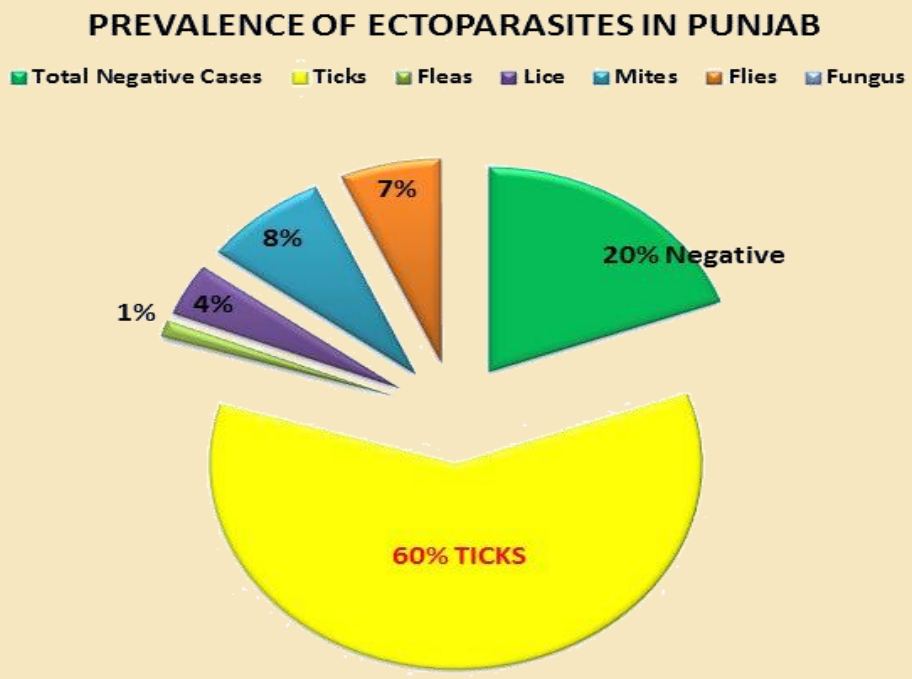
The above chart shows the highest prevalence of sub-clinical mastitis in district Jhang (27.5%) followed by district Faisalabad (18.60%), Bhakkar (13.65%), Toba Tek Singh (13.04%) and Chiniot (3.98%).

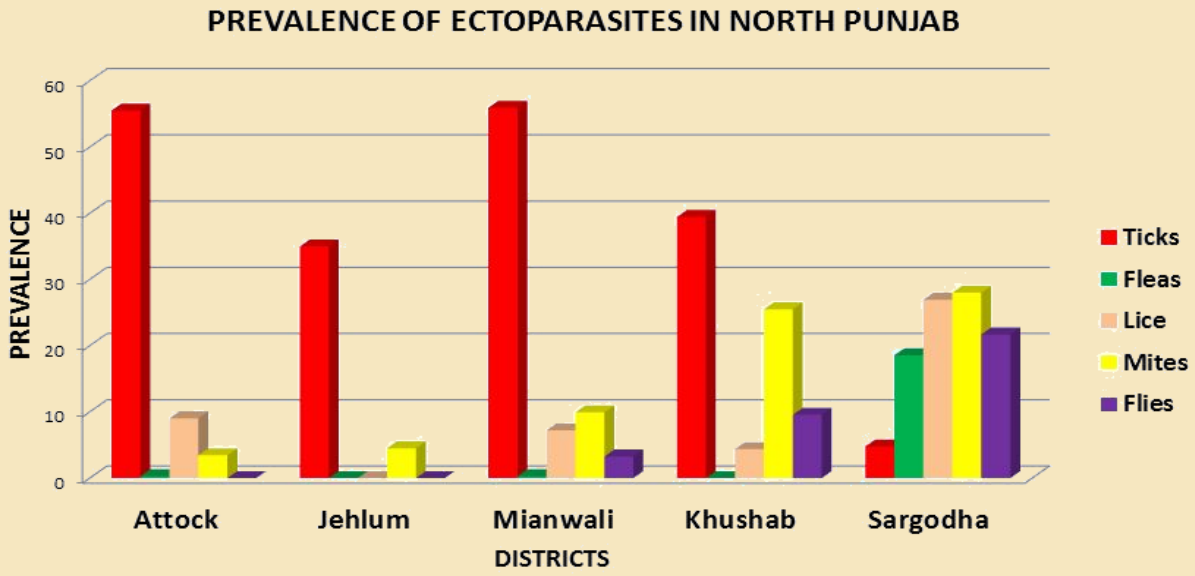


The above chart indicates the highest prevalence of sub-clinical mastitis was recorded in Northern Punjab (22.80%), followed by Central Punjab (17.24%) and Southern Punjab (15.03%).

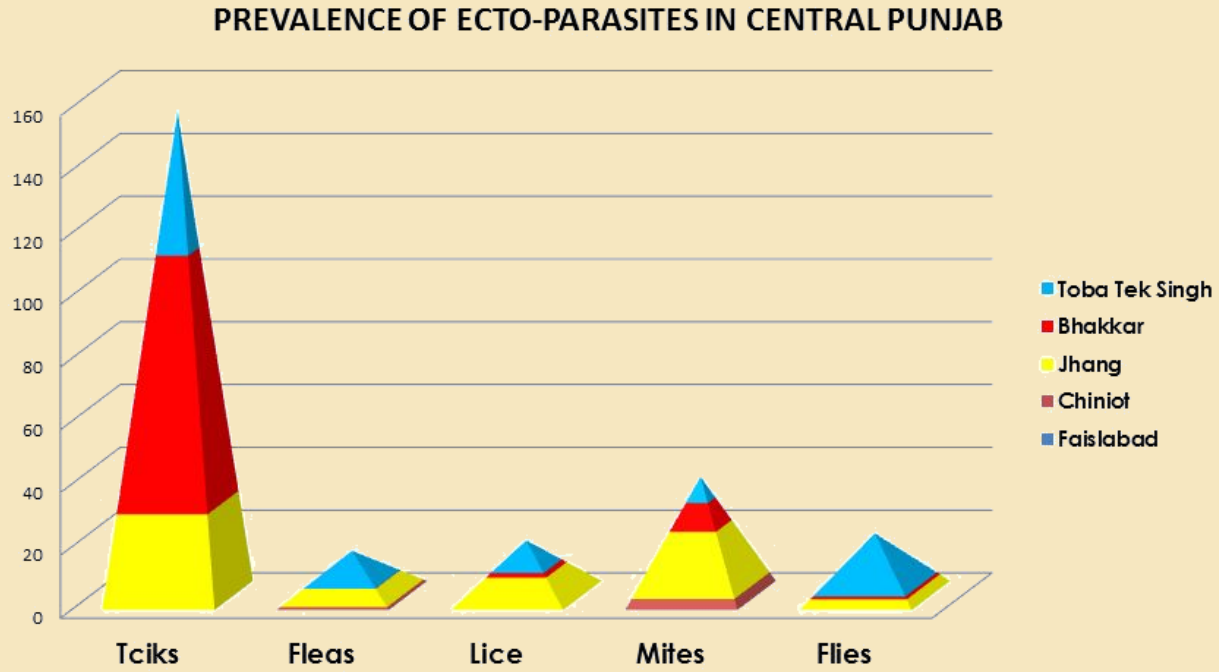
ECTO-PARASITES

A total of 30408 camels were examined for ecto-parasites, out of which 24499 were positive. Out of these positive samples; 60.27% were positive for ticks, 1.30% for fleas, 4.15% for Lice, 8.17% for mites, 6.65% for flies and only 0.03% samples were positive for fungal infection that were reported only in district Jhelum.



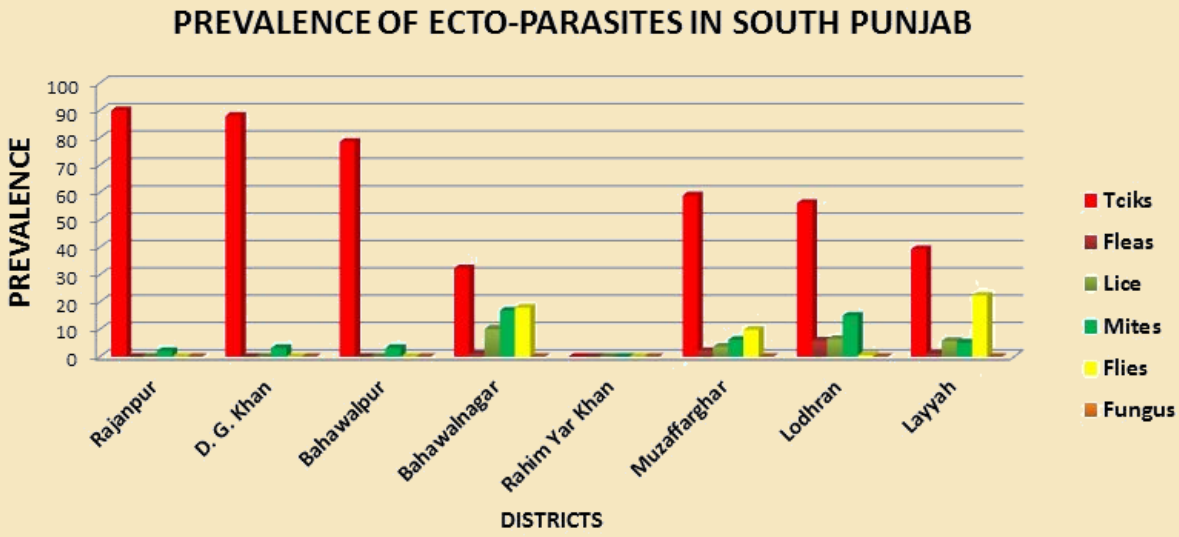


The above chart indicates the highest prevalence of ticks in Mianwali (55.95%), followed by district Attock (55.52%), Khushab (39.44%) and Jehlum (35%).



The above chart indicates the highest prevalence of ticks infestation of camels was recorded in district Bhakkar (79.98%),

followed by Toba Tek Singh (44.35%); whereas, the highest prevalence of mites were reported in district Jhang (18.98%).



The above chart indicates that the highest prevalence of ticks infestation was in district Rajanpur (90.03%), followed by district D. G. Khan (88.09%), Bahawalpur (78.59%), Muzaffargarh (58.93%), Lodhran (56.15%), Layyah (39.33%) and Bahawalnagar (32.32%).

PNEUMONIA IN CAMELS

A respiratory disease (possibly multi-factorial in origin) of upper respiratory tract, characterized by fever (up to 106◦F) associated with dyspnea, gummy nasal discharge (occlusion of nasal passages in later stages), stretching of neck in an effort to inhale more air, and anorexia in all age groups and in either sex of camels of all breeds, occurred during May 2016. The duration of illness without intervention was up to 7 days. Camel kids mostly succumbed to the disease. The disease was wide-spread throughout the Punjab and responds readily to Oxytetracycline and Mepyramine Maleate. A total of 9076 cases of respiratory disease were successfully treated throughout the Punjab.

CONTAGIOUS ECTHYMA

Contagious Ecthyma is an infection of the skin which can also infect man. Young camels (6 months to 2 years of age) are mostly affected. It may be associated with diarrhea leading to death of the animals. Animals recovering are immune for life, and nursing calves attain some degree of immunity through colostrum for the first few months of life. The high prevalence of the disease among camel populations of the Punjab demands earnest surveillance and awareness among camel herders about the disease. During the first year of the Project, a number of cases from Attock and Dera Ghazi Khan were diagnosed through ELISA and were successfully treated.


2016/08/06

Anthrax-like Disease

The disease was encountered right at the outset of the Project in Thal districts (Bhakkar, Khushab, Mianwali, Layyah, and Jhang) and taxed the life of about 100 camels during April and May 2015. Active surveillance coupled with techniques of participatory rural appraisal was used to support the laboratory diagnosis under the banner of the Project. The salient features of the disease are as under:

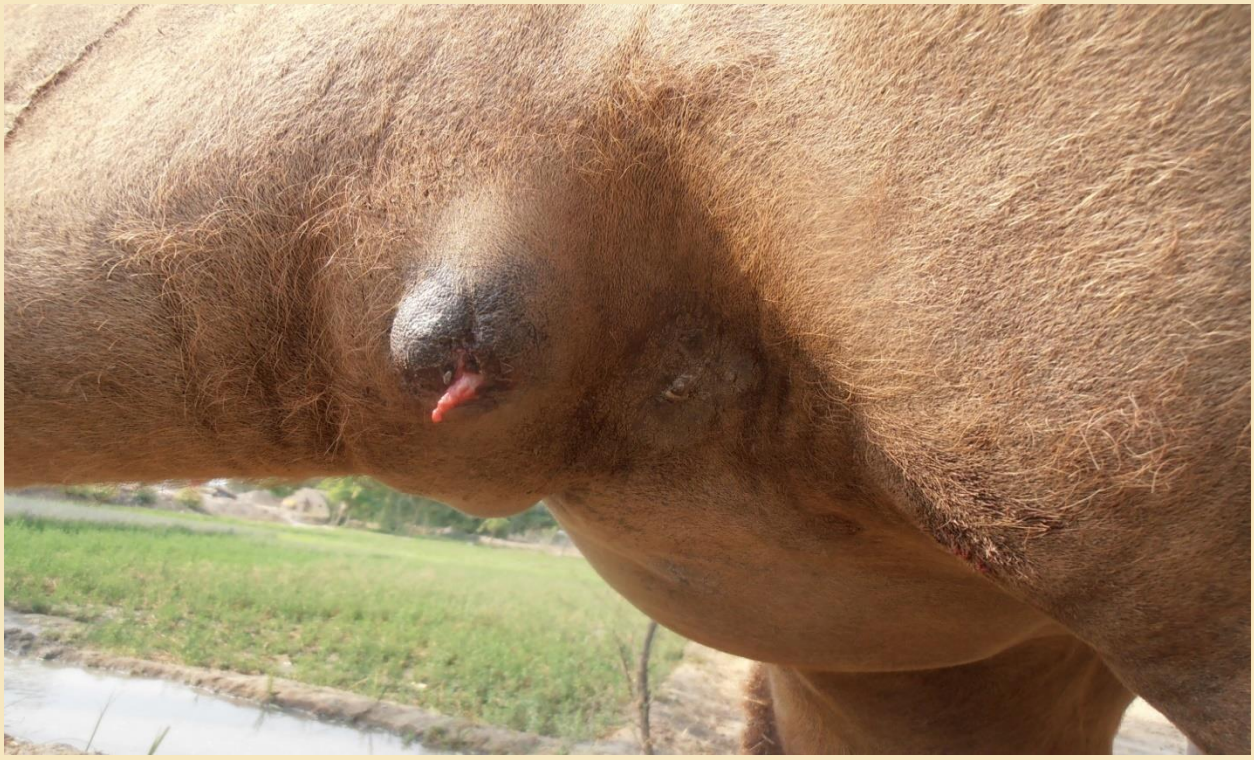
- The mortality in camel population started in the last week of April 2015.
- Most of the camels were found dead without showing any premonitory signs (i.e. sudden death). In a few cases, shivering for a few seconds leads to collapse and immediate death of the animal.
- In most of the cases there was no oozing of blood from the natural orifices.
- In none of the case tarry colored un-clotted blood oozed from natural orifices of cadaver.
- In some cases oozed out blood contained bubbles (foam / froth).
- In most of the cases, wherein blood was oozing out of natural orifices, carcass was not opened.
- The blood failed to clot in most of the cases after death.

- Facial and cervical swelling occurred in some of the cases.
- Respiratory distress and diarrhoea was observed in none of the cases.
- Biting flies like Tabanid and nasal bots (*Cephalopina titillatror*) were not reported by any of the informants.
- Rigor mortis occurred in most of the cases.
- All carcasses that were opened showed extreme congestion of colon and rectum along with hepatomegaly in Khushab. Only one carcass that was opened showed splenomegaly. Haemorrhagic enteritis of small intestine was observed in a few cases in Bhakkar.
- Mortality occurred in both male and female camels. All the animals that encountered this occult disease were adult. No causality had occurred among suckling calves.
- The occurrence of cases of the disease was sporadic in time and haphazard in space.
- No disease condition with similar set of manifestations was reported from other livestock species or human beings of the locale.

It was suspected that Bacillus anthracis like organism (as for example *Bacillus cereus biovar anthracis*) might be involved in the causation of the disease condition.

CASEOUS LYMPHADENITIS

Cases of Caseous Lymphadenitis (caused by *Corynebacterium pseudotuberculosis*) were found in camel populations of Layyah during searching and treating cases of sarcoptic mange. The disease was characterized by formation in the superficial lymph nodes (muscular and sub-cutaneous) and internal organs (*e.g.*, lungs) of capsulated abscesses containing concentric layers of yellow green/ white granular pus. It was realized through the active surveillance, during June 2016, that the brunt of this disease in the camel population of Layyah demands earnest efforts encompassing surveillance in all the target districts.



DERMATITIS

Through active surveillance it was transpired during the first year of the Project that the Sarcoptic mange (caused by *Sarcoptes scabiei var. cameli*) is affecting camels of all ages, sexes, and breeds throughout the Punjab. It is a highly contagious disease which can spread to herdsmen or others associated with infected animals. The infection leads to a loss of appetite with a subsequent loss in condition and productivity.

The prevalence, enormity, economic & zoonotic importance of the disease demands its surveillance and control. In Layyah and Muzaffargarh during June-2016 under the banner of the Project active disease search and treatment of all cases was done. It was realized that the process of surveillance coupled with treatment of cases be continued during the rest of the gestation period of the Project to curb the menace of sarcoptic mange in camels of all the project-districts.

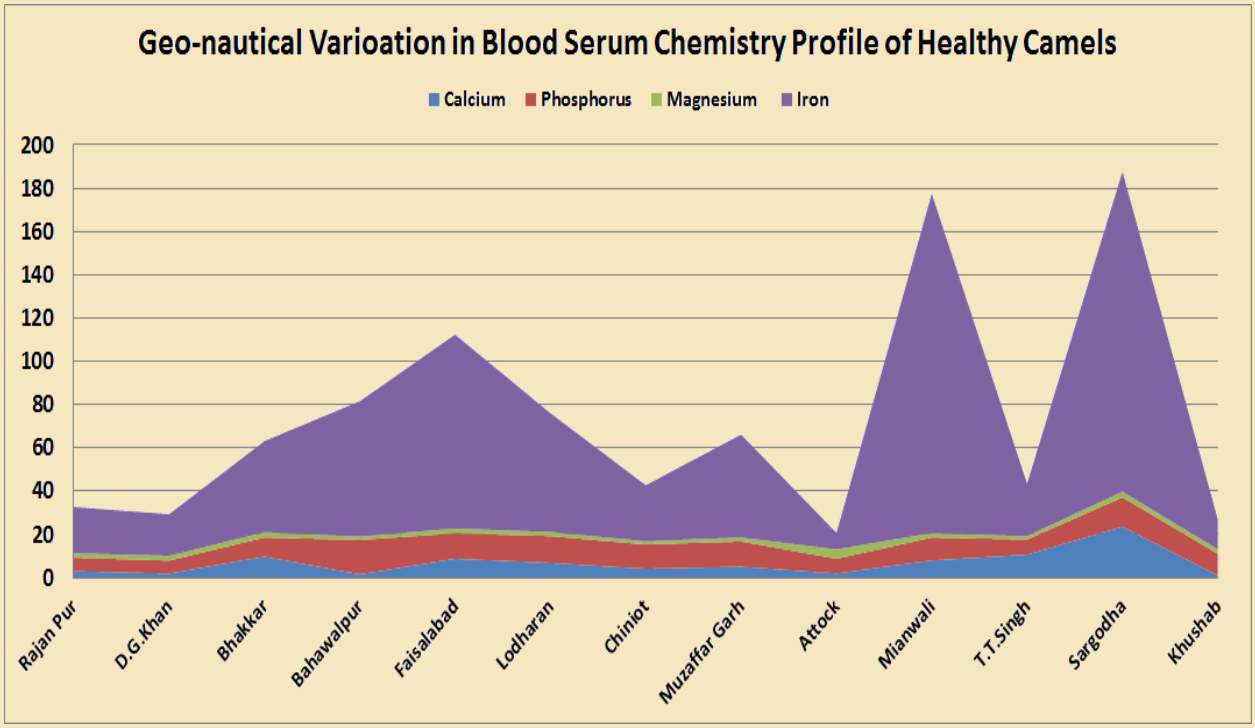
To control the progression of mange, after clipping, scrubbing and washing with soap, bleaching powder solution (0.5 - 1%), applied on the living skin around mange to disinfect the area followed by exposure to sun for 2 weeks and supplementation of multi-vitamin minerals mixture, was done.

A fungus *Trichophyton verrucosum* cause roundish-hairless-non-pruritic white spots with thick crusts on the head, neck and other parts of the body of camels. These lesions are called "Ringworm". Lesions may become confluent and involve extensive areas. Young animals (up to 3 years of age are mostly affected by ringworm. The active disease search during the first year of the Project revealed that the condition was ubiquitous in all camel-populations of the Punjab. The cases respond very well to Tincture of Iodine.

MINERAL DEFICIENCY

Deficiency of various macro- and micro-minerals is an avenue that demands earnest efforts. Determination of normal concentration of macro-minerals, micro-minerals, enzymes and other parameters in the blood of camels of both sexes, in multiple age groups, and of different geo-graphical locations was done under the banner of this Project. This profile will help in sero-diagnosis of diseases related to abnormal serum blood chemistry level of macro- and micro-elements. In camels the deficiency of calcium & Phosphorus shows stiff gait, difficult to move, increase in size of the joints especially fore-limbs, lameness and sometimes arched back. Calves of camels in calcium deficiency show abnormal curvature of the shift of the long bones. The deficiency of zinc cause alopecia.

The deficiency of such types results in pica. Pica is the licking, chewing, and eating of unusual objects like bones, grits, clothes, etc. The symptoms are mud-eating, weakness, emaciation and anemia. Pica can be cured by offering camels with mixture rich in different type of essential minerals.


Geo-nautical Varioation in Blood Serum Chemistry Profile of Healthy Camels
Calcium
Phosphorus
Magnesium
Iron
200
180
160
140
120
100
80
60
40
20
0
Rajan Pur
D.G.Khan
Bhakkar
Bahawalpur
Faisalabad
Lodharan
Chiniot
Muzaffar Garh
Attock
Mianwali
T.T.Singh
Sargodha
Khushab

FARMER DAYS FOR MASS AWARENESS

Farmer days were conducted in the target areas to impart awareness the camel herders about the positive impact of strategic deworming towards their social and economic uplift. Two special vehicles equipped with audio-visual gadgets were used to apprise camel herders. Mass strategic deworming was also the hallmark of these farmer days.


خوشخبری
اونٹ پال حضرات
کیلئے
آپکے اونٹوں کے
مفت علاج معالجہ بذریعہ موبائل سروس حکومت پنجاب کا خصوصی پراجیکٹ
جانور خریدنے سے قبل اسکی صحت کی
تصدیق منڈیوں میں موجود محکمہ کے
موبائل ہسپتال سے ضرور کریں
محکمہ لائیوسٹاک اینڈ ڈیری ڈویلپمنٹ حکومت پنجاب
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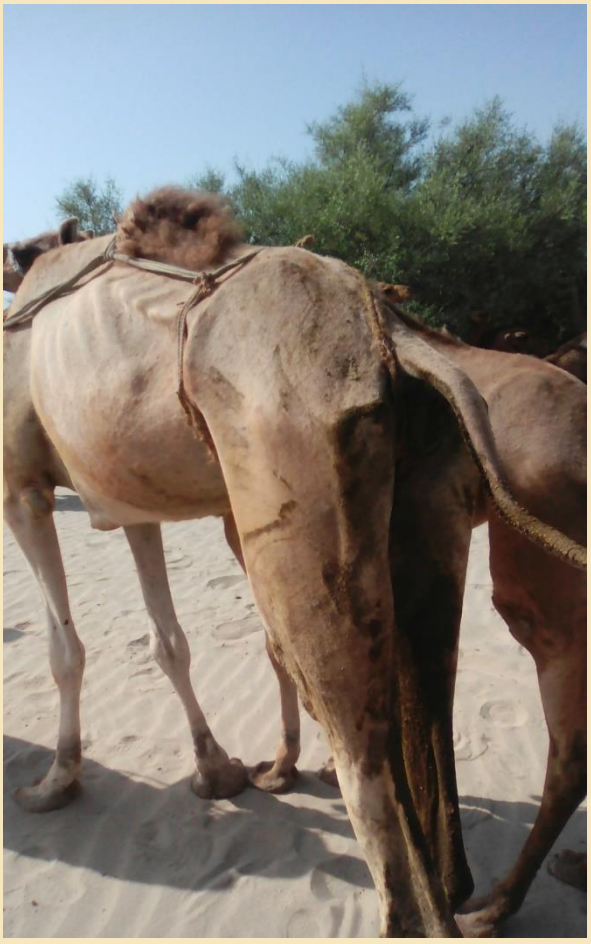
Institute of
Information Technology
ATTOCK CAMPUS

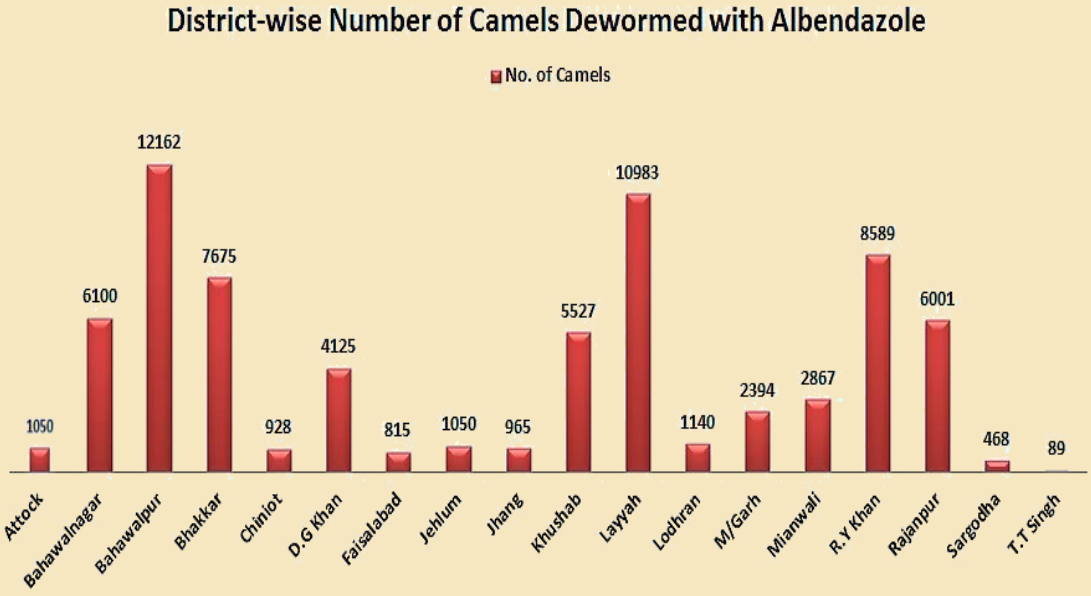
DEWORMING CAMPAIGN

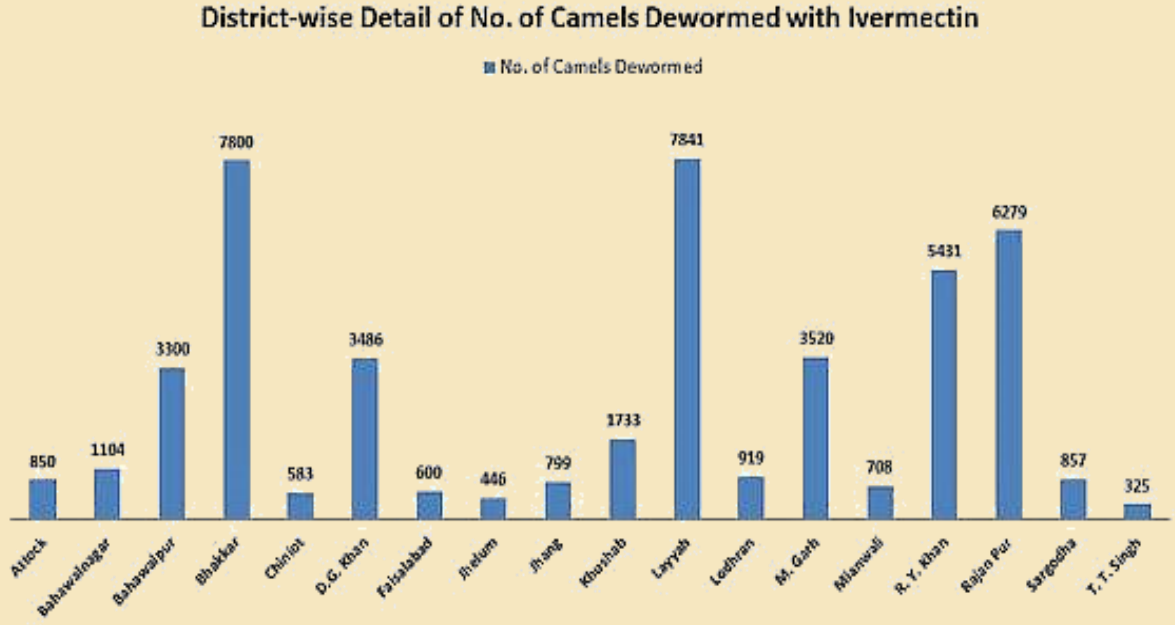
Ivermectin and Albendazole deworming campaigns were launched under the banner of the Project to curb the worm load and ecto-parasitic infestation.



Number of Camels Dewormed under the Project

(by January 10, 2017)





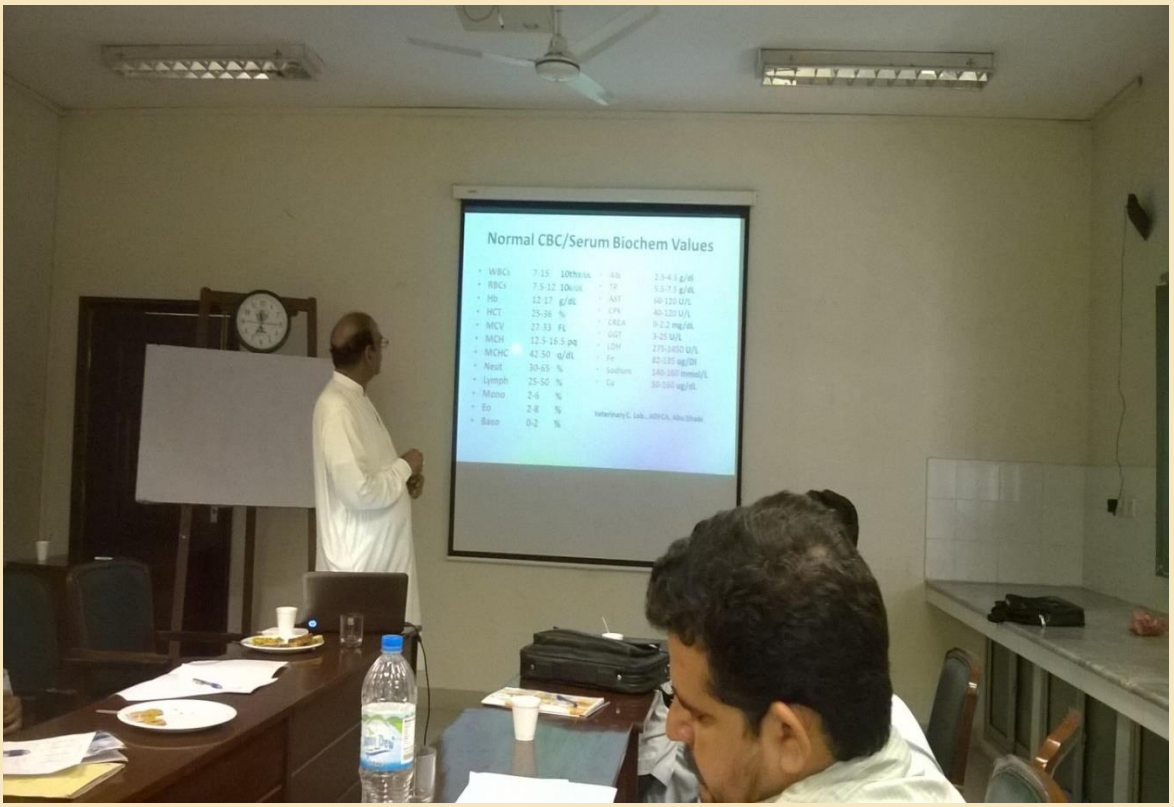

لیبارٹری

Mobile Camel Dispensaries

Two Range Rovers-Defender vehicles after major improvisation, customization and branding are being used for the awareness of those camel owners / farmers which are mostly located in far flung areas (deserts) where normally the treatment and diagnostic services do not reach. Provision of on-the-spot diagnosis and treatment is doing a great favor to these camel owners.

Training of Veterinarians

Veterinarians were trained under the banner of the Project, in the art and science of diagnosis and management of camel diseases. Special training sessions were conducted at University of Veterinary and Animal Sciences Lahore. Experienced resource persons imparted the best of their knowledge and experience during these training sessions. All the technical staff of diagnostic laboratories of target districts attended these training sessions.



DISCUSSION

The camels are the sole bread winners for the majority of marginalized communities the lives in the mountainous and sandy terrains of the Punjab. The wellbeing of this animal is directly linked with the economic uplift of these communities within their domicile. The parasites of various kinds harbor and create hindrance in the expression of their true genetic potential of these camels. No serious and comprehensive study has yet been conducted to gauge and apprise the camel herders regarding the brunt and the positive impact of these parasites on the health and productivity of these animals. The present study showed the prevalence of endo-parasites, ecto-parasites, hemo-parasites in Punjab is 71.18%, 80%, and, 15.03% respectively. The 1.45% population is positive for brucellosis. The study reveals 16% prevalence of sub-clinical mastitis in Punjab.

The highest prevalence of endo-parasites was recorded in the Central Punjab. The infestation of endo-parasites mainly reduces the health and production performance of the camels. This scenario justified the use of strategic doworming to check the impact of this menace and mass-appraisal of camel herders to adopt regular deworming as a routine management practice.

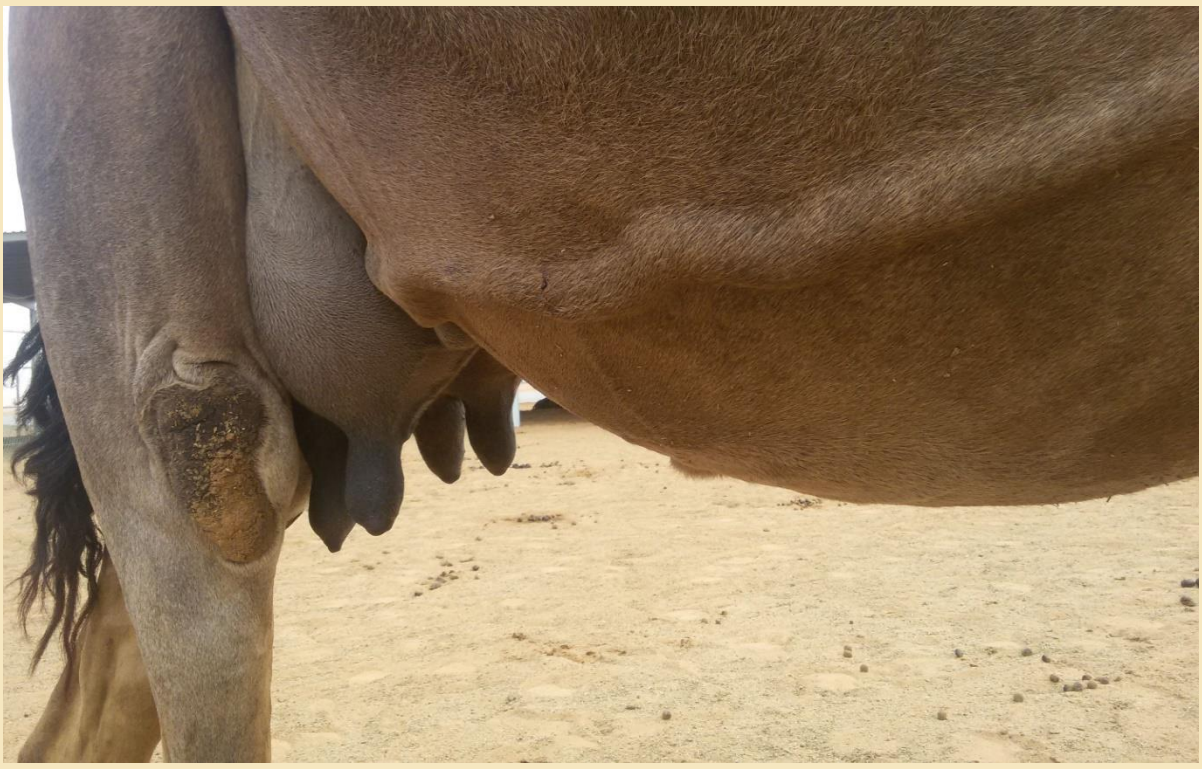
The overall point prevalence of blood parasites in camels was 15.03%. The higher incidence of tick infestation predisposes camels to infestation with various hemo-parasites but may also leads to tick-paralysis. Tick-infestation invokes consistent irritation, leading to rubbing against trees or other objects; often resulting in various other invasive skin diseases and conjunctivitis. The prevalence of hemo-parasites in North Punjab was recorded to

be higher (20.16%) than Central Punjab and Southern Punjab. This high rate of prevalence in North Punjab was due to more ticks (infected with blood parasites) load and seasonal unrestricted movement of non-dewormed nomadic flocks. In Northern Punjab, ticks remain active for longer period of time due to humid environment. The study recorded the prevalence of Trypanosomes in Northern Punjab, South Punjab, and Central Punjab to be15%, 5%, and 4%, respectively. The prevalence of babesiosis in camels was recorded as 5%, 1%, and 3% in Central Punjab, Souther Punjab, and Northern Punjab, respectively. This is not much alarming situation in the Province. There is need to control the ticks infestation, for controlling the transmission of blood parasites and to improve the camel health and productivity. The animals infected with blood parasite become lethargic, weak, emaciated, and anorexic. Besides these, if the treatment is not done well in time, heavy infection lead to icterus, jaundice, anemia and ultimately death of the animal. So tick

infestation should be noticed with serious concern, as they play major role in transmission of these deadly pathogens.

The overall prevalence of brucellosis in camels was 1.45%. Because of its zoonotic importance, this state is alarming and demands earnest efforts to curb this menace.

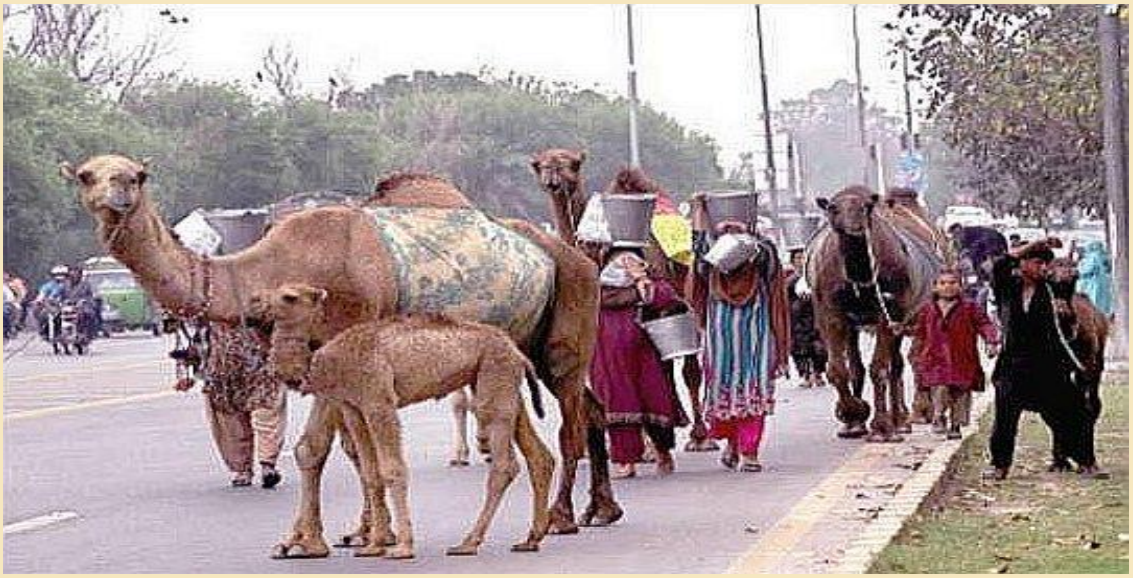
In humans, brucellosis can be a serious, debilitating and sometimes chronic disease that may affect a variety of organs. Most cases are caused by occupational exposure to infected animals or the ingestion of unpasteurized dairy products.



The prevalence of sub-clinical mastitis in Attock and Sargodha districts of Northern Punjab was 24.05% and 20.90%, respectively.

The prevalence of sub-clinical mastitis was at high rate (29.06%) in Bahawalpur. In Central Punjab District, the highest prevalence of sub-clinical mastitis was recorded in Jhang (27.50%).

Attending various prevalent camel maladies has created awareness among camel-herders that timely veterinary attention can save their livelihood. At the same time this intervention has improved the confidence of the masses on the pro-poor policy of the Government. The farmer days and meeting have further augmented this process of confidence building and pave the way to bridge the commination gap.

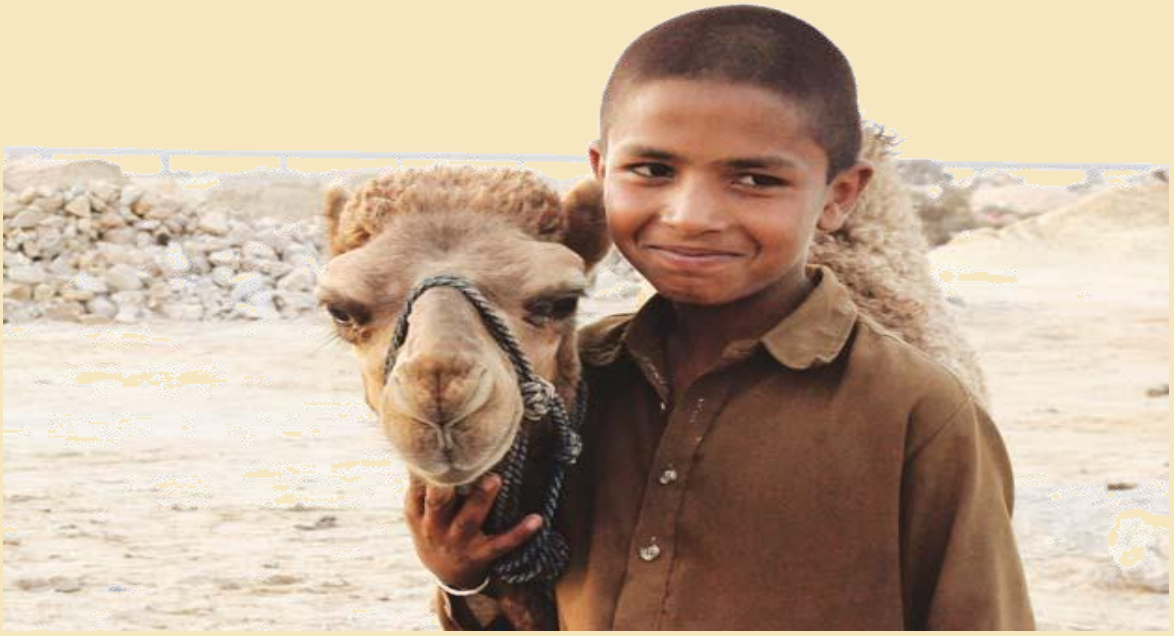


The women folk of camel-rearing-communities in Central Punjab remained the target for changing the mindset towards strategic regular deworming and treatment against ecto-parasites and mineral deficiencies. The impact of this approach will improve the productively life of camels.

Camel population was enumerated through door to door deworming campaign through ivermectin. Further refinement of the data would be made under the deworming campaign through Albendazole during the second year. This database would aid to further plan strategy for growth, and delivery of better services to camels. Annexure A gives the detail of on-going Albendazole campaign.

SALIENT ACHIEVEMENTS

- Baseline data on the brunt of parasitism in camel populations of the Punjab
- Ivermectin deworming campaign
- Awareness Campaign
- Training of technical staff of diagnostic laboratories in the diagnosis and management of prevalent camel diseases
- Active surveillance (active disease search, diagnosis, treatment, and control) for camel diseases
- Determination of blood serum chemistry profile for important elements
- Enumeration of camel population
- Strengthening of diagnostic laboratories of the target districts



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ATTRACTIONS OF SECOND YEAR

Topics of Farmer Awareness

- Camels have a very high requirement for salt. Camels need about 6-8 times as much salt as other animals, so they need to regularly graze on halophytic plants to remain healthy. There is need to apprise camel herders about such plants. In seasons of scarcity of such vegetation, ample quantity of common salt should be supplemented to camels. Salt blocks are okay, but free choice loose salt is better. All camels should have access to salt at all times.
- Camels are very sensitive to selenium deficiency. It would be a good approach to periodically check the blood selenium level especially of young and pregnant camels. Selenium deficiency can cause a wide range of symptoms in adults, from compromised reproduction and poor hair coats to muscle damage and possible immune suppression. If needed, selenium can be supplemented mixed with a small amount of grain or in a free choice mineral mix. However,

monitor the amount consumed, as excessive selenium can also be a problem.

- Offering high carbohydrate and high protein diets to camels may cause many problems. Camels are not designed to live on such concentrated feeds they are superbly adapted to deriving nutrition from coarse forages.
- Mineral and vitamin supplementation should preferably be made to those camels that are on dry vegetation/ hay. Fat-soluble vitamins, especially E and A, are abundant in green grass but degrade quickly in dried hay. In all vitamin-mineral mixtures formulated for camels the high copper and iron level is not advisable under normal circumstances.

- Never feed pre-mixed formulated ration (wanda) which is specifically formulated for cattle or chickens to camels. These may contain ionophores (coccidiostats and growth promotants such as monensin, rumensin or salinomycin) which are poisonous to camels.

- A good deworming program for camels in our settings is to alternate Ivermectin and Albendazole after every two months.
- Since there is no organized breeding strategy, all breeds are getting mixed up due to lack of selective breeding.
- Due to poor breeding knowledge among the camel herders the use of available male stock is mostly used for breeding.
- The calving interval of 24 months can be reduced to 18 months if the female is properly nourished.

Indices of Health

- Body Temperature → 35.0○C – 38.6○C (95.0○F – 101.5○F)

Fluctuations are commonly observed in the body temperature of the camel, which is able to adjust its own body temperature. The temperature is lowest at dawn and gradually increases until sunset before dropping during the night. It may vary from day to day.

- Pulse Rate / Minute → 30 – 50

The pulse of the camel can be taken from' the posterior tibial artery, with the animal in a sitting position. The medial sacral artery, near the root of the tail, can also be used.

- Respiration Rate / Minute → 5 - 12

A higher respiration rate is often indicative of a febrile reaction. Like the pulse rate, respiratory rates tend to be higher at noon than in the early morning. The camel is capable of closing its nostrils and breathing through its mouth. At such times the lower lip tends to become pendulous. Occasionally the animal will puff out its cheeks during mouth breathing.

- Vomiting occasionally occurs in the dromedary and is not necessarily a sign of disease. Camels are nervous animals and may vomit and spit when handled. When vomiting occurs in an undisturbed animal, however, it should be regarded as a symptom of disease.

- Normal Hematological and Serum Chemistry Values in Local Camels
  - Haemoglobin = 10 – 12 gm/100ml
  - PCV = 30 - 34%
  - Erythrocyte Count = 7.5 – 11 million/mm3
  - Leukocyte Count = 10 – 20 thousands/mm3
  - DLC

- Neutrophils = 39%
- Lymphocytes = 46%
- Eosinophils = 1%
- Basophils = <1%
- Monocytes = 6%

- Normal Range of Serum Chemistry Values
  - Total Proteins = 7 - 9 mg/dl
  - AST = 16 – 26 U/L
  - ALT = 5 – 17 U/L
  - Calcium = 5 – 11 mg/dl
  - Potassium = 4 – 6 mg/dl (3.5 – 4.5 mEq./L)
  - Sodium = 125 – 137 mg/dl (167 – 169 mEq./L)
  - Phosphorus = 4 – 6 mg/dl
  - Iron = 64 – 130 µg/dl
  - Glucose = 74 – 145 mg/dl
  - Urea = 44 – 56 mg/dl
  - Creatinine = 1.4 – 1.6 mg/dl
  - Magnesium = 2.5 mg/100ml
  - Copper = 70 – 120 µg/dl
  - Zinc = 70 – 120 µg/dl

Diseases of Camel

The diseases of camel may be broadly divided into two main groups:

1. Non-specific camel diseases (occur in many other animals as well as camels)
2. Specific camel diseases

Non-specific Diseases
• Surra • Mange • FMD • HS • Rabies • Anthrax • BQ • Bovine Rhinotracheitis • BVD • Rinderpest • PPR • Anhidrosis • Haemonchosis • Camel Pox

Specific Camel Diseases
• Dipetalonemiasis • Jhoaling • Kapauli • Mora • Malee • Wail • Kumree

Trypanosomiasis (Surra)

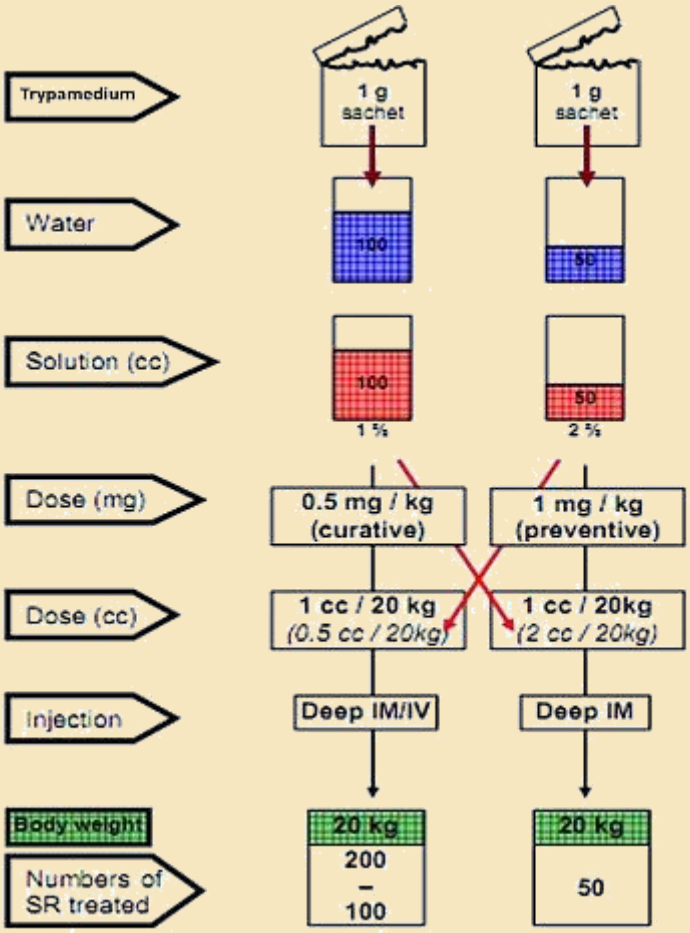
Caused by Trypanosoma evansi which are transmitted by biting flies (Tabanids). It is more frequent in humid areas. The disease increases after rainy season because flies multiply. Surra is characterized by:

decreased appetite, decreased water intake, exercise intolerance, weakness and debility, atrophy of the hump (hump disappeared), anemia (pale mucous membranes), recurrent fever, edema of dependent parts (belly and neck), corneal opacity, diarrhea, alopecia, keratinization, depletion of subcutaneous fat.

Treatment:

① ANTRYCIDE PRO-SALT (e.g., BIQUIN, QUINAMIN, TRYBAN, NOROQUIN) Quinapyramine Sulphate 1.5 gm + Quniapyramine Chloride 1.0 gm @ 4.4mg/kg b.wt. Add 15 ml sterile water for injection and shake well to make suspension for immediate use. The recommended dose is 0.025 ml per kg body weight subcutaneously. Do not exceed total dose of 15 ml. To obtain the best results accurately assess the body weight. The dose may be given in two or more divided doses at 6 hours interval, and these should be massaged following injection. Repeat treatment for every 3 months. The drug is trypanostatic in action; therefore, immune system of the camel would itself overcome the infection. The drug should not be used in young stock because it cause salivation, sweating, polypnoea, tachycardia and death might occur. Do not administer to camels with impaired renal and/ or hepatic function.

② ISOMETAMIDIUM CHLORIDE (SAMORIN/TRYPAMIDIUM) @ 0.25-0.5mg/kg b.wt. deep intramuscularly. It is effective when trypanosomes are resistant to other conventional drugs. It has narrow safety margin. There may be relapse after the use of the drug. There is severe local reaction at the site of injection. Prepare the drug dilution according to the guidelines on sachets. After dilution, use the solution within 24 hours; only if stored at 4-8◦C the solution can be used up to 48 hours.



Trypamidium is also sold in sachets of 125mg (= 0.125g). Dilute the contents of this sachets in 12.5ml (1% solution for curative effect) or

in 6.25ml (2% solution for preventive effect). Diminazine should never be used in one-humped camel.

Camel Pox

The disease mostly affects the young camels of 2-3 years of age. Nutritional and environmental stress may lead to herd-outbreaks. Four stages are observed e.g., fever →①papule formation → ②vesicles → ③pustules → ④ scab formation.

There is enlargement of lymph nodes and diffuse oedema.

Treatment: Give antibiotics (Penicillins + Streptomycin or Enrofloxacin) along with antiseptic dressing of lesions.

Dipetalonemiasis

It is caused by a nematode *Dipetalonema evansi*. The condition is usually asymptomatic but heavy infestation may cause fever, emaciation, exercise intolerance, and orchitis. *D. evansi* inhabits the spermatic cord, pulmonary arterioles, mesenteric & femoral arteries, right auricle, and lymph nodes; whereas its larvae (microfilariae) are found in peripheral blood. The camels living near rivers have high prevalence. The young camels in the warmer months of the year are more susceptible. Transmission is through Aedes mosquitoes. Light infection is asymptomatic. In heavy infection there is weakness, shrinking of hump, exercise intolerance, ↓appetite, lethargy, weakness of hind legs, ↑ body

temperature (39.4◦C to 39.8◦C), arteriosclerosis, abortion, and death in adults & neonates. The condition is usually chronic and may last for years.

Diagnosis is made by examination of wet blood film, stained blood smears, Knott's technique or micro-hematocrit centrifugation technique. Microscopic examination of wet blood film reveals the microfilariae (larvae) with progressive serpentine movements.

Differential diagnosis is made from surra, helminthiasis, malnutrition, and other causes of unthriftiness.

Treatment: Injection ivermectin @ 1ml/50Kg b.wt. S/C. After about 3 weeks of this inoculation, the microfilaraemia gets cleared. Injection Fouadin (a trivalent compound of antimony and sodium) @ 0.5-0.8ml/Kg b.wt., give 3 intravenous doses. Orchedectomy for filarlial orchitis.

Contagious Necrosis of Skin (Jhoaling)

This bacterial disease is characterized by the necrosis of skin, abscession, sinus formation and enlargement of lymph nodes.

Aetiology:

① Streptothrix bacteria,
② Other bacteria (sometimes fungi),
③ Salt deficiency

Salt requirement of camel are 6-8 times higher than cattle. Roughly, 160 gm of salt is required per day. So advise the camel owners to give a handful of Sodium Chloride (NaCl) to their camels EVERYDAY instead of after weekly interval.

Transmission: (a) Direct (by contact with ill camels); (b) Indirect (by fomites) – fomites are inanimate objects to which the camel rub its body to allay severe itching.

Pathogenesis: painful swelling → the skin becomes hard and dry over the center of swollen area → dead center get separated from the surrounding healthy skin→ exudation of pus → sloughing off the center → ulcer.

Clinical Signs: The common sits of lesions are withers, neck, sides of body, quarters, and rump. There is severe itching. The animal tries to rub and bite the lesions. The necrotic areas of skin do not involve the sub-cutaneous tissues. The size of lesion varies from the size of a 50 paisa coin to the size of a "hand palm". After 2-3 weeks a line of demarcation appears between dead and live tissues. At this stage if scab is pressed thick pus will come out along the margin of scab. Further progression of the disease gives sloughs or ulcers with unsightly appearance. The ulcers do not heal easily. The lymph nodes are swollen. Prognosis is usually favorable and healing lead to bald un-pigmented star shaped scar.

Treatment is both therapeutic and surgical

Wash the wound → debride it → apply counter-irritant (if necessary) →do ASD (with Tr. of iodine) → Give Sodium chloride on daily basis (160 gm/head/day).

Kapauli

It is characterized by purulent sinusitis of nasal sinuses (frontal & maxillary). Etiology: Unknown. Disease may be associated with some injury, kick or blow on the head region. It may be a complication of Surra.

Clinical Picture:

- Muco-purulent discharge from nostrils,
- Animal keeps its head higher than normal,
- Do not like to bow its head while grazing or drinking water; prefer browsing,
- Loss of appetite
- Dullness and depression,
- Lack of rumination,
- Constipation (due to ↓ intake of feed and water)
- Fever
- Percussion on the sinuses elicits the dull sound instead of normal hollow sound,
- Sometimes the pus comes out of the sinuses after affecting the skin and bone.

Treatment: Trephining the area by trephine machine → ASD with $KMnO_4$ solution or acriflavin + course of Enrofloxacin.

Wail

Loss of control of hind quarters is seen in this disease.

Aetiology: Unknown. Disease is common in the areas where LANA (a sand herb) is fed to the animals. Camels eat the Lana with relish. Continued consumption of Lana lead to Wail. Bracken fern is a plant which is found at hilly stations. It is said that this plant has Thiaminase enzyme which causes the deficiency of vitamin B1 (Thiamine). Perhaps Lana also shows its effect on the same pattern.

Treatment: Injection vitamin B-complex + Injection Mericyl (arsenic preparation)

Kumree

This is a condition in which camel feels difficulty while sitting on the ground. Animal quivers for some time (varying from case to case) while making attempts to sit down. Sometimes the animal may take 10 minutes to sit down. Animal stands normally. This is unsoundness for camel.

Etiology: Undetermined

Treatment: Give tonics e.g., Injection of Vitamin A, D3, and E + Multi-vitamin & minerals mixture

Camel Mange

The only mite that infects camels is *Sarcoptes scabiei var. cameli*. Sarcoptic mange affects animals of all ages and sexes. The organism requires 2 or 3 weeks to multiply, after which the population explodes, spreading very rapidly all over the animal body and through the herd. Infection generally starts in the head region, extending through the neck to other areas with thin skin, such as the penile sheath and the udder. The whole body may become infested within a month. Affected areas become swollen, hardened, hairless and wrinkled, especially in the hindquarter, thigh and hock joint areas. Infected foci are highly irritating, forcing the animals to scratch themselves and rub against one another, or against other objects such as trees, thereby spreading the infection even further. The infection leads to a loss in feeding and grazing time, with a subsequent loss in condition and productivity. Seriously affected animals are often unsightly and blood may be seen oozing out of areas traumatized by scratching and rubbing.

Treatment: ① isolate the infected animals → ②clip around the infected areas →scrubbing with a brush → washing with soap → ③ disinfect living quarters with 5–10% phenol → ④ exposure to sun for 2 weeks

Ivermectin or Doramectin Injection

Symptoms of Nutritional Deficiency

Vitamin A

Three forms (congenital, postnatal and subclinical) of hypovitaminosis A were observed clinically in camels. ①Congenital form: Calves suffering from congenital deficiency of vitamin A are born blind or showing multiple congenital deformities likes hydrocephalus or anophthalmos. ②Postnatal form: The symptoms are characterized clinically by loss of appetite, reduction in the growth rate, true xerophthalmia, (with thickening and clouding of the cornea) and discharge of thin serous mucoid from the eyes. ③Subclinical form: Mainly in adult camels, characterized by night blindness and loss of reproductive function in both males and females.

Vitamin D

The appearance of one of the osteodystrophic diseases (Rickets and Osteomalacia) as well as loss of appetite and weakness.

Vitamin E

Two forms of the deficiency are common.

①Acute form: The clinical form usually occurred in calves' is characterized by sudden death without showing any obvious symptoms.

②Subclinical form: Mainly in adult camels. This form is characterized by impaired fertility and a gradual reduction in muscular activity.

Vitamin B_1

The clinical findings showed variable signs including disorientation, aimless walking with a high stepping gait due to blindness, anorexia, opisthotonus or head retraction (star gazing), muscle tremor and convulsion followed by recumbency with paddling movement and death. Thiamine deficiency in camels usually occurs in sporadic cases. Higher rate of incidence of vitamin B_1 (Thiamine) deficiency occurs in camels with age range of 2-4 years.

Selenium

Poor performance, stiff gait, lethargy, anorexia, heart and respiratory disturbances and reduced fertility in adult camels are the main clinical findings of selenium deficiency.

Calcium & Phosphorus

The clinical symptoms of both deficiencies usually appear gradually, in the early stage of the disease, calves (one month-one year) shows stiff gait, difficult to move, increase in the size of the joints especially the fore limbs, lameness and sometimes arched back. Later on and as the condition aggravates, calves

shows abnormal curvature of the shift of the long bones with an abnormal increase in the depth and width of the epiphyseal plates of particularly the long bones. General weakness, emaciation and appearance of abnormal appetite are the main signs that are observed in adult camels.

Copper

Clinical form is mostly noticed in young calves (4-6 months) and is characterized by ataxia and incoordination of the legs, particularly fore-legs, followed by leg deformities and poor growth. Adult camels are often infected with subclinical form. Signs in subclinical form (blood copper levels below 60 µg/dl) include general weakness, low milk production, anemia, temporary infertility, rough hair coat and depigmentation.

Iodine

In camels, both forms (clinical and subclinical) occur. Young camels are usually prone to the clinical form more than adult camels. In this form, calves are either born with goiter or the disease appears in calves 1-2 months old. The characteristic findings are birth of stillborn or weakness in newborn calves with gross palpable enlargement of the thyroid gland. Adult camels usually show subclinical form which manifested clinically by loss of libido in the male, failure to express estrus in the female, and high incidence of aborted, stillborn or weak calves.

Iron

Low serum iron (40 µg/100ml) is associated with sever mange, heavy tick infestation, diseases accompanied by fever and trypanosomiasis.

Dosage of Drugs for Camels

- **Metamizole** (e.g., Dipyrone) 20-40 ml---- I/M or I/V
- **Amoxycillin** (e.g., Farmox LA, Clamoxyl) 2-7 mg/kg---- I/M
- **Enrofloxacin** (e.g., Enrotil) 5 mg/kg--- I/M
- **Norfloxacin** (e.g., Doctorgin) 5 mg/kg---I/M
- **Penicillin** (e.g., Penicillin G) 10000 – 22000 IU/kg----I/M
- **Streptomycin + Penicillin** (e.g., Penbiotic, Penevit) 2-3 ml/50kg--- I/M
- **Oxytetracycline** (e.g., Oxyfar, Oxidil) 5 mg/kg---I/M or I/V
- **Oxytetracycline LA** (e.g., Remacycline) 1ml/10 kg---I/M
- **Pheniramine maleate** (e.g., Avil) 5 – 10 ml---I/M
- **Dexamethasone** (e.g., Dexafar) 10 – 30 mg/ large camel---- I/M (do not use during last four months of gestation)
- **Prednisolone** (e.g., Predivet) 200 mg/ large camel--- I/M (do not use during last four months of gestation)
- **Ethyl Alcohol** 70% solution
- **Hydrogen peroxide** 0.2 – 3% solution
- **Potassium permanganate** 1 g/liter water
- **Tincture of Iodine** 2 – 5 % solution in alcohol
- **Acriflavine** 0.1% solution
- **Albendazole** 7.5 mg/kg--- orally
- **Oxfendazole** 4.5 – 5 mg/kg--- orally
- **Furosemide** (e.g., Lasix) 0.5 – 1 mg/kg--- I/M
- **Nystatin** (e.g., Mycostatin ointment) 100000 IU/g---------apply on skin
- **Oxytocin** 20 – 40 IU/ large she camel--- I/M
- **Ivermectin** 10%(e.g., Ivomec) 0.2mg/kg---S/C
- **Trichlorfon** (e.g., Neguvon)

- **Cypermethrin** (e.g., Ecofleece)
- **Deltamethrin** (e.g., Delta 25)
- **Epsom salt** (Magnesium sulphate) 250 g + large amount of water---- orally
- **Xylazine** (e.g., Rompun) 0.25–0.5 mg/kg for minor surgery; 1–2 mg/kg for complete immobilization---I/M or I/V
- **Lignocaine hydrochloride** (e.g., Lignocaine, Lidocaine) ---- inject for local anaesthesia
- **Acaricide Spray**

Three applications at weekly intervals are generally used, irrespective of the acaricide. A sprayer with a pressure of about 500 g/cm2 took approximately 3 minutes to cover one camel completely, requiring 9 liters of the solution.

Revision: 09 May, 2016

PC – I

"PROPHYLACTIC MEASURES AND SERO-SURVEILLANCE OF CAMEL AND CAMEL MILK PROCESSING IN PUNJAB"

Project Cost = Rs.84.078 Million

GS # 3714

Gestation Period

(01-07-2015 to 30-06-17)

Project Directorate of Diagnostic Laboratories

Livestock and Dairy Development, Punjab, Lahore

Email: dadrs@livestockpunjab.gov.pk

PART – A

PROJECT DIGEST

1	Name of Project.	*"Prophylactic Measures and Sero-Surveillance of Camels and Camel Milk Processing in Punjab".*
2	Authorities responsible for: i) Sponsoring ii) Execution iii) Operation and Maintenance	Government of the Punjab, L&DD Department Director General (Extension), L&DD, Punjab, Lahore. Project Director, Diagnostic Laboratories, L&DD, Punjab, Lahore
3	Time required for completion of Project: (in months)	2 years (01-07-2015 to 30-06-17)
4	**(a)Plan Provision:** i) If the project is included in the current five-year. Plan, specify actual allocation. ii) If not included in the current plan how is it now proposed to be accommodated (Inter/intra sectoral adjustments in allocation or other resources may be indicated). iii) If the project is proposed to be financed out of Block provision for a Programme; indicate: (b)Provision in the current year PSDP/ADP.	N/A The Project is included in the ADP 2015-16 with GS # 3714 and original allocation ofRs.100 million during the year 2015-16. The revised allocation after revision during the year2015-16 is aboutRs.50 Million. N/A. N/A.
5	Relationship of the project with the objectives of sector indicate the contribution of the project quantified if possible the targets in five years plan and the names of the other projects whether sanctioned or under preparation which would form part of an integrated program with in the sector.	Camel owners, at large, are poor. The livelihood of pneumatic camel cart owners depends upon the soundness of their camels. In most of the cases, camel is their sole bread-winner. Apart from that, camel meat is a special dish in large wedding banquets and receives highly esteemed guests. The camel is also becoming increasingly popular as a sacrificial animal at the occasion of Eid-ul-Azha. Camel milk in various processed forms is an esteemed dietary item. Camel milk, on an average, consists of 5.1% lactose, 4.8% fat, 3.8% proteins and 0.9% ash. Camel milk is rich in vitamin C and can be used for the treatment of many diseases, including tuberculosis and dropsy. Camel hide is used for making suitcases, ornamental cases of table lamps, etc. The prices of camels vary according to its health, quality and milking capacity of she-camel. The price for the trained and racing camel may range between Rs. 150000 and 200000 while she camel with good milking capacity (*i.e.*, 10 kg/ day) may fetch up to Rs. 120000. In most cases, prices for the camel range between Rs. 45000 and Rs. 60000. Camel health is important both in terms of financial loss to the owner and sufferings that the animal bears. No base-line data/

		information as yet is available for the policy makers to design doable action plans for the development and wellbeing of camels and indirectly to uplift the socio-economic status of the camel owners. This vision is in line with the economic objectives for the uplift of livestock sector.
6	Cost of Project i). Local Cost. ii). Foreign Exchange. iii). Total.	 84.078Million - 84.078Million
7	Annual recurring expenditure after completion: (In Million Rupees) i). Local Cost. ii). Foreign Exchange. iii). Total.	 N/A -- N/A
8	Objectives of the project preferably in quantitative terms.	1. To strengthen the 18 District Diagnostic Laboratories for surveillance of Camel diseases including diseases due to mineral deficiency by providing equipment, reagents, kits, material for the collection of samples, un- interrupted electric supply and cold chain facilities etc. 2. To have a base-line data on the enormity of various diseases of camels in order to formulate doable action plans for the socio-economic development and welfare of camels and their owners. 3. To ascertain the prevalence of major diseases of camel, including mineral deficiency diseases and zoonotic problem, for formulation of prophylactic measures and control strategy. 4. To assess the brunt of ecto-parasites, endo-parasites and haemo-parasites on the camel population of the target districts. 5. To enhance indirectly the productive and reproductive potential of local breeds of camels. 6. To assess the prevalence of sub-clinical mastitis. 7. To provide the medication against the endo-parasites, ecto-parasites and Trypanosomiasis (surra). 8. To educate the camel farmers through audio-visual aid, regarding the control of diseases and better husbandry practices for improving the health and production of camels.

SUMMARY COST

Prophylactic Measures and Sero-Surveillance of Camels and Camel Milk Processing in Punjab

Detailed Function/Object	TOTAL Rs. In Million
Contingent paid staff (three drivers alongwith three Helpers for Bhakkar, Bahawalpur &Chiniot @ Rs.526/-(skilled) and Rs.463/-(unskilled).	1.650
Repair of existing vehicles alongwith installation of Canopies and improvisation for the placement of lab items and conversion of two Land Rovers-Defender (RIG 1186 and CEC 85 AF) with major repair, improvisation/customization and branding.	9.400
Purchase of Machinery & Equipments	13.930
Purchase of Medicines for Hemo, Ecto and Endo-parasites	25.000
(Stationery, Printing, Adv. & Publicity and Cost of other store)	5.550
Purchase of kits and laboratory consumables for diagnosis and surveillance	3.548
T. A. for the staff engaged in surveillance	7.000
POL for the vehicles engaged in sero-surveillance	18.000
Grand Total	**84.078**

METHODOLOGY

- DLOs and ADIOs of the target districts will jointly identify the main loci of camel population within their respective districts.
- Each ADIO of the target districts will decide the number of samples to be collected from each loci of camel population within the district. Sample size of each target district is given in **Annexure B.**
- Meeting will be organized with the Veterinary Officers of the target areas who cater the veterinary needs of the identified camel populations at District Diagnostic Laboratory. Detailed deliberation of the Project is given to them by the concerned ADIO. After briefing, each concerned Veterinary Officer will chalk out his/ her plan for the collection of samples and conduction of farmer days/ meeting in the target camel populations in collaboration with the para-veterinary staff under his/ her jurisdiction. All the individual plans will be organized in the form of a schedule, to avoid overlapping of dates and times, by the ADIO in consultation with VOs on the same very day. After consensus the schedule would be presented to concerned DLO for approval. The approved schedule would be communicated to PD (Diagnostic Laboratories) and concerned Regional Directors.
- According to the schedule the staff of Diagnostic Laboratory would approach the concerned Veterinary Officer and Veterinary Assistant who will actively assist in the collection of samples from the target population and administration of the medicaments against endo-, ecto- and heamo-parasites.
- The samples (feeal, blood, skin, and milk samples as per No. of samples required) will be collected and processed on-the-spot and the diagnostic results, in this regard, will be communicated to the farmers on specially designed printed report in urdu. The medication (against endo-, ecto- and haemo-parasites) will be administered accordingly on herd/ individual basis at the same time by the concerned Veterinary Assistant in the presence of Laboratory Staff. Empty bottles/ vials/ sachets/ cans will be handed over to the camel owner with the instructions to present it as and when required by the Monitoring Authority. Milk samples positive for sub-clinical mastitis will be cultured on selective mediaand subsequent antibiotic susceptibility testing.
- Each District Diagnostic Laboratory will communicate the progress report on the prescribed format through Email on monthly basis on (dadrs@livestockpunjab.gov.pkand dadrs786@gmail.com). Detail of all the samples collected and analyzed will be recorded in the database of SPMS-L&DD through ICT based virtual system of e-communication on daily basis.
- Similarly, the serum will be harvested on the day of collection and after proper labeling (along with SPMS number) and packing will be dispatched to Bhakkar and Lahore for sero-diagnosis. These laboratories will record the results of sero-analysis on the database of SPMS-L&DD. The detail of results would also be communicated to concerned District Diagnostic Laboratory.

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Authors

Dramatis Personae

We pay tribute to the following team who endeavored meritoriously within the sphere of their assigned task to make this Project a success story:

Sr. No.	Name	Designation
1	Mr. Rafi	Superintendent o/o PD (DL) Lahore
2	Dr. Irsa Zafar	ADIO Chiniot
3	Dr. Sohail Khan	ADIO Bahawalpur
4	Dr. Aamir	VO Diag. Lab. Bhakkar
5	Dr. Rafi	VO Mobile Camel Dispensary Bhakkar
6	Dr. Shoukat	VO Mobile Camel Dispensary Bahawalpur
7	Dr. Rizwan Samee	ADIO Rajan Pur
8	Dr. Hassan Mujtaba	ADIO Dera Ghazi Khan
9	Dr. Saima Manzoor	ADIO Bahawalnagar
10	Dr. Shoaib Ashraf	ADIO Rahim Yar Khan
11	Dr. Rabia Warda	VO Diag. Lab. Rahim Yar Khan
12	Dr. M. Taqib Iqbal	ADIO Layyah
13	Dr. Samee	VO Diag. Lab. Layyah
14	Dr. Jahanzaib	VO Diag. Lab. Lodhran
15	Dr. M. Mukhtar	ADIO Khushab
16	Dr. Ghulam Yaseen	ADIO Lodhran
17	Dr. Hina Zafar	ADIO Toba Tek Singh
18	Dr. Hayat Ullah	ADIO Muzaffargarh
19	Dr. Javeria Riaz	VO Muzaffargarh
20	Dr. Faiza Aslam	ADIO Faisalabad
21	Dr. Uneeb Saliah	Assistant Director (P) Faisalabad

Sr. No.	Name	Designation
22	Dr. Khuram Nawaz	ADIO Jhelum
23	Dr. Sajjad Ahmed	Ex. ADIO Attock
24	Dr. M. Hameed	ADIO Attock
25	Dr. Owais Masud	ADIO Mianwali
26	Dr. Javaid Arif	ADIO Sargodha
27	Dr. Farhat Nazir Awan	ADIO Lahore
28	Dr. Abdul Zahra Baloch	ADIO Mandi Bahauddin
29	Dr. Ghulam Murtaza	ADIO Bhakkar
30	Dr. Imran Sarfraz	Ex ADIO Jhang
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32	Mr. Islam ul Hq Anjum	Assistant o/o PD (DL) Lahore
33	Mr. Qamar Javaid	Senior Clerk o/o PD (DL) Lahore
34	Mr. Altaf Shah	Data Manager o/o PD (DL) Lahore
35	Mr. Saleem	Computer Operator o/o PD (DL) Lahore
36	Dr. Yasmeen Abbas	SVO Diag. Lab. Lahore
37	Dr. Farooq	VO Diag. Lab. Sargodha
38	Dr. Shakeel Khaliq	VO Diag. Lab. Lahore
39	Dr. Kashif Farooq	VO Diag. Lab. Lahore
40	Mr. Bilal	Lab. Attendant o/o PD (DL) Lahore
41	Mr. M. Hussain	Lab. Assistant o/o PD (DL) Lahore
42	Mr. M. Aslam	Naib Qasid o/o PD (DL) Lahore

The meritorious efforts render by all the Veterinary Assistants, Laboratory Assistants, Laboratory Attendants, Drivers, Clerks, Peons, Sweepers, and Chokidars of Diagnostic Laboratories are commendable.

PICTURE GALLERY

Sargodha

Jhang

Bahawalpur

Rahim Yar Khan

Layyah

Muzaffargarh

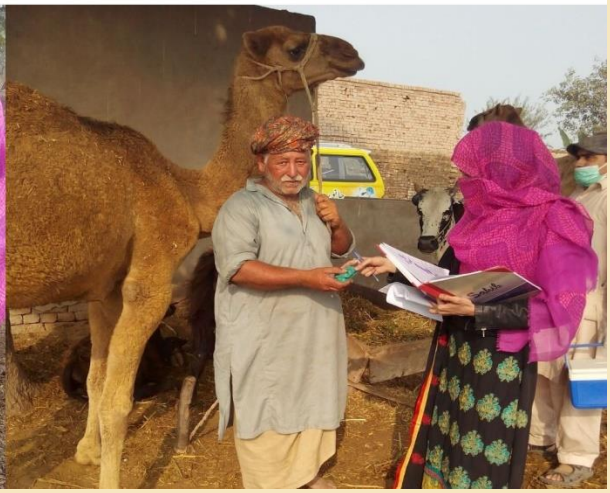
Rajan Pur

Bhakkar

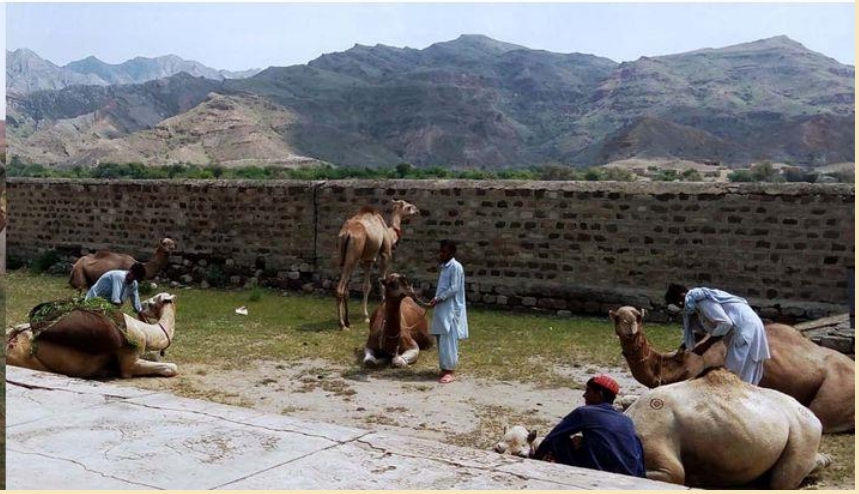
Attock

Bahawalnagar

Chiniot



Dera Ghazi Khan



Jhelum

Khushab

Lodhran

Mianwali

Faisalabad

Toba Tek Singh

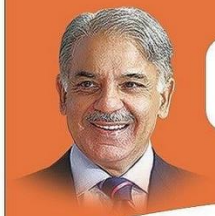
Field Treatment Data of Camel on 9211

(by September 12, 2016)

Sr. No.	Farmer Name	Mobile Number	Mauza_Code	District	Tehsil	Mauza_name	No. of Animals
1	ALI	923326922467	LE61	Lahore	Lahore Cantt	Padhana	1
2	ASMA	923326660352	LE42	Lahore	Shalimar	Bagrian Sadan	1
3	YOUNS	923014988571	SK432	Sheikhupura	Safdarabad	Khanqah Dogran	4
4	KHADIM	923337684873	JH140	Jhang	Shorkot	Khan poor	1
5	M RAMZAN	923435513605	BK382	Bhakkar	Kallur Kot	Akbar Kaleer	1
6	SADIQ KHAN	923009680322	LD10	Lodhran	Lodhran	Haveli Naseer Khan	10
7	AKRAM	923013759328	LY25	Layyah	LAYYAH	14. Samtia Thal	1
8	AKRAM	923013759328	LY25	Layyah	LAYYAH	14. Samtia Thal	1
9	RAFI	923446850068	MI116	Mianwali	Piplan	Ghandi	1
10	RAFI	923446850068	MI116	Mianwali	Piplan	Ghandi	1
11	RAFI	923446850068	MI116	Mianwali	Piplan	Ghandi	1
12	TAMOR.AFRIED	923325947733	JL22	Jhelum	Jhelum	Darapur	8
13	QAISAR	923015544046	MI116	Mianwali	Piplan	Ghandi	1
14	QAISAR	923015544046	MI116	Mianwali	Piplan	Ghandi	1
15	QAISAR	923015544046	MI116	Mianwali	Piplan	Ghandi	1
16	MUHAMMAD MUMTAZ	923436926183	SG368	Sargodha	Sargodha	Chak # 83 /NB	4
17	GHAFUR	923479491505	CK339	Chakwal	Choa Saiden Shah	Lahar Sultan Pur	1
18	GHAFUR	923479491505	CK339	Chakwal	Choa Saiden Shah	Lahar Sultan Pur	2
19	SHABIR	923413493242	BK308	Bhakkar	Mankera	17/RH	1
20	YASEEN	923447823656	BK236	Bhakkar	Mankera	Patti Balanda	3
21	ATA	923008969351	BK348	Bhakkar	Kallur Kot	Noon Dagger	1
22	IQBAL	923448688242	BK236	Bhakkar	Mankera	Patti Balanda	1
23	SABIR	923450679934	BK236	Bhakkar	Mankera	Patti Balanda	2
24	ALI	923473418258	BK236	Bhakkar	Mankera	Patti Balanda	1
25	ARIF	923451159450	BK236	Bhakkar	Mankera	Patti Balanda	1
26	FAAZ	923347627505	BK249	Bhakkar	Mankera	Dagger Kotli Shumali	1
27	ALLHA BAKHSH	923470697899	BK249	Bhakkar	Mankera	Dagger Kotli Shumali	1
28	HASSAN	923144912560	MI116	Mianwali	Piplan	Ghandi	1
29	M.MANSHA	923436578195	GW585	Gujranwala	Wazirabad	Ali Pur Chatha	1
30	RAMZAN	923451725899	MI116	Mianwali	Piplan	Ghandi	1

21918	BASHIR	923417149678	LD285	Lodhran	Kehror Pacca	22/M	1
21919	ALLAH WASAYA	923462644314	LD286	Lodhran	Kehror Pacca	Ameer Pur Saadat	2
21920	POOLY KHAN	923410880244	BR71	Bahawalpur	Yazman	Chak 97/DB	68
21921	MEVA KHAN	923481693498	BR71	Bahawalpur	Yazman	Chak 97/DB	55
21922	ALAM SHER	923461881363	BK194	Bhakkar	Darya Khan	9 TDA	1
21923	ALAM SHER	923461881363	BK194	Bhakkar	Darya Khan	9 TDA	1
21924	MEVA KHAN	923481693498	BR71	Bahawalpur	Yazman	Chak 97/DB	155
21925	CHUHA KHAN	923420780549	BR71	Bahawalpur	Yazman	Chak 97/DB	45
21926	M ASIF	923471073580	BR71	Bahawalpur	Yazman	Chak 97/DB	45
21927	ASIF KHAN	923407098075	BR71	Bahawalpur	Yazman	Chak 97/DB	52
21928	AZIZ	923088114161	MG766	Muzaffargarh	Jatoi	Meer wala	1
21929	PANDI	923337473752	RN448	Rahim yar Khan	KHANPUR	PHUL LAULAI	4
21930	PANDI	923337473752	RN448	Rahim yar Khan	KHANPUR	PHUL LAULAI	4
21931	RASOOL BUX	923460872632	RN448	Rahim yar Khan	KHANPUR	PHUL LAULAI	4
21932	RASOOL BUX	923460872632	RN448	Rahim yar Khan	KHANPUR	PHUL LAULAI	14
21933	SHABIR AHMED	923487399730	FS385	Faisalabad	Samundri	444/GB	4
	TOTAL						75488

اونٹوں کو بیماریوں سے بچانے اور پیداواری صلاحیت بڑھانے کیلئے



حکومت پنجاب کی طرف سے

مفت تحفہ

اونٹ پال حضرات کو

منرل مکسچر

1 ہزار گرام

اجزائے ترکیبی					
	کیلشیم 43.08 فیصد	فاسفورس 23.53 فیصد	سوڈیم کلورائیڈ 15.41 فیصد	میگنیشیم 15.01 فیصد	مینگیز 1.60 فیصد
	زنک 1.137 فیصد	آیوڈین 0.047 فیصد	کاپر 0.46 فیصد	کوبالٹ 0.01 فیصد	سلینیم 0.003 فیصد

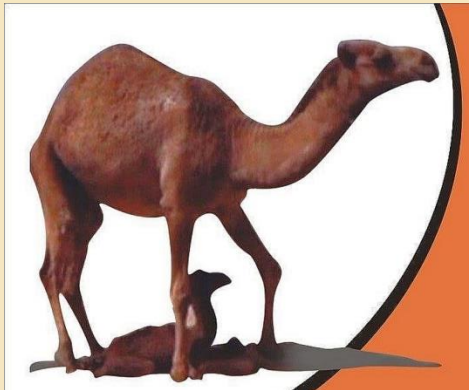
ترکیب استعمال: 200 گرام فی اونٹ اور بچے کو 100 گرام ایک مرتبہ آٹے یا گُڑ میں ملا کر دس دن تک روزانہ استعمال کریں

ہوشیار: صرف اونٹوں کے استعمال کیلئے

محکمہ لائیوسٹاک اینڈ ڈیری ڈویلپمنٹ، حکومت پنجاب

فوائد

- جلد بارآوری
- جلد بلوغت
- بچہ جننے کا وقفہ کم
- دودھ اور گوشت کی پیداوار میں اضافہ
- بیماریوں کے خلاف قوتِ مدافعت میں اضافہ



اگر آپ اپنے اونٹوں کا دودھ فروخت کرنا چاہتے ہیں تو درج ذیل نمبر پر رابطہ کریں

08000-9211

احتیاط

خشک اور ٹھنڈی جگہ پر نمی سے بچا کر رکھیں

سورج کی روشنی سے بچائیں

بچوں کی پہنچ سے دور رکھیں

ادویات سازی لائسنس نمبر 000552

تیار کنندگان

اتاباک فارماسیوٹیکل انڈسٹریز

5C آئی ٹین تھری انڈسٹریل ایریا اسلام آباد (پاکستان)

ATTABAK

بیچ نمبر:

بنانے کی تاریخ:

2 سال تک قابل استعمال

قیمت ~~750~~ روپے