

Prevalence of Some Livestock Diseases at The Teaching Veterinary Hospital (TVH), Alkadaru, Khartoum North, Sudan.

¹Suhair Sayed Mohaed, ²Amna Osman Mustafa, ²Ayaa Emad, ²Thoweba Fath Alrhman Alhaj, ²Mawada Haroon, ²Meaad mostafa, ²Haifa Alsadeg, ²Samar Adam and ²Tasneem bakhit

¹Dep. of Surgery, Obstetrics and Gynaecology, College of Veterinary Medicine, University of Bahri, Director of the Teaching Veterinary Hospital, Alkadru, North Bahri, Sudan

²University of Bahri, College of Veterinary Medicine, North Bahri, Sudan

Received: 6/6/2019

Accepted: 12/9/2019

Abstract:

This research aimed at focusing on the incidence of some diseases that affect livestock health and production during January 2018 in Khartoum North. A total of 384 animals (158 cattle, 45 sheep, 142 goats, one donkey and 38 camels) were presented to the Teaching Veterinary Hospital (TVH), College of Veterinary Medicine, University of Bahri, with different health problems. Blood, fecal and milk samples were taken for the investigation of blood parasites (BPs), Brucellosis (BR), internal parasites (INPs) and Mastitis (MAs) respectively. Five ml. of blood samples were taken from the jugular vein of each animal and blood smears were made for Brucellosis Ps, serum samples were obtained for BR test, fecal samples were prepared for INPs examination and milk samples were subjected to California Mastitis Test (CMT) for MAs. Out of 201 cases' blood smears examined, 132 (65.67%) were positive for BPs, theileriosis 93 (70.45%), babesiosis, 27 (20.45%) and 12 anaplasmosis (9.09%). Thirty five cases' fecal samples were examined for INPs out of which 8 (22.86%) were only positive, 6 nematodes (17.14%), one trematodes (2.86%) and coccidia (2.86%). A total of 169 samples of serum were tested for brucellosis and only 4 cows (2.96%) and one goat (0.59%) were positive. Five milk samples of cows were examined for MAs and 4 (80%) of them were positive. It is concluded that animal productive and reproductive activities are adversely affected by certain diseases and some of them are zoonotic and affect human health and performance. Veterinary hospitals or clinics are important health services centers as they reflect field health problems to be solved by the veterinary authorities.

Keywords: Livestock, disease, Brucellosis, Mastitis. Veterinary hospitals

Introduction:

The Sudan is characterized by diversity of climatic conditions, grazing lands and livestock (Payne 1986). Sheep and goats are important livestock species in Sudan for their ability of converting forage, crops and house hold residues into meat, milk and skin (FAO, 1985). They are characterized by early age of maturity, require low inputs for a moderate level of production and are profitable to keep (Devendra and Burns, 1970). Camels have multi-functional roles in different production systems, they are well adapted to the local environmental conditions and can survive in zones which are prohibitive for other livestock species (Wilson 1984). Camels are infected with blood parasites and internal parasites and the migration pattern of camels owners maintain the transmission cycle between parasites and

vectors(Ishag and Ahmed ,2011)).The production and reproduction of livestock are affected by their health conditions. Milk production is affected by dairy cows' management and health as well as goat sheep (Adam, 1997).

In the tropical regions, blood parasite infections cause significant economic losses in livestock (Chandrawathani *et al.*, 1994). Blood parasite infections in ruminants are caused by the protozoans such as *Babesia* sp, *Trypanosoma* sp, *Anaplasma* sp, and *Theileria* sp. These protozoans are transmitted by arthropod vectors such as ticks and flies ,the infection is characterized by anemia, emaciation, jaundice and in severe cases, mortality . The important step in reducing morbidity and mortality in farms is vector control. Babesiosis is caused by intraerythrocytic protozoan parasites of the genus *Babesia* ,it is transmitted by ticks, and it affects a wide range of domestic and wild animals and occasionally people (Levine 1985).

Gastro-intestinal parasites infections of ruminant livestock cause major problems in their health and production (Soulsby, 1982). Helminth parasites are parasitic worms that feed on a living host causing poor nutrient absorption, weakness and disease in the host. Helminth parasites include nematode, trematode and cestode. These parasites feed on the tissue or body fluid or competing directly animal food (Solusby, 2007). With heavier worm burdens clinical signs such as weight loss, diarrhoea, anaemia, or sub-mandibular oedema (bottle jaw) may develop(Lughano and Dominic, 1996). Moreover,some economic losses incurred by these parasites include reduced animal performance and weight gain, condemnation of whole carcass or affected organs at slaughter houses, cost of treatment, and mortality in severe cases (Perry *et al.*, 2002).These parasites are difficult to manage because in some cases they develop resistance to all available commercial dewormers (Zajac and Gipson, 2000;Kaplan, 2004).

Mastitis is defined as the inflammation of the mammary gland (udder). It may be caused by physical injury or stress or by bacteria which invade the mammary gland. The bacteria which are known to cause mastitis in cows, ewes and does are *Streptococcus* sp., *Staphylococcus* sp., *Pasteurella* sp., and coliforms, such as *E. coli* . Mastitis has a significant economic impact (Mavrogianni *et al.*,2001) due to losses of discarded abnormal milk and milk withheld from cows ewes and goats treated with antibiotics, costs of early replacement of affected animals, reduced sale. value of culled cows, costs of drugs and veterinary services and increased labor costs. Clinical cases of mastitis are source of losses, but of economical importance is the subclinical mastitis due to its high prevalence and association of decreased milk production (Las Heraz *et al.*,1999).

Brucellosis is one of the major diseases that seriously hamper animal industry , it is a significant cause of reproductive losses usually caused by *Br.Abortus* in cattle, and camels , *Br.melitensis* and *Br. Ovis* in small ruminants, *Br.suis* in pigs and *Br. Canis* in dogs(OIE,2000).In Sudan cattle brucellosis was firstly reported by Bennet(1943)and its prevalence is found to be high in all parts of the country . In Africa caprine and ovine brucellosis are endemic in the Mediteranean countries and countries in the eastern part of the continent (Robertson,1976). Brucellosis in camels has emerged as one of the major cause of abortion which had a negative impact on camel's breeding and export(Abu Damir *et al.*,1984),the prevalence of brucellosis in camels is increasing in some localities in Sudan(Omer *et al.*,2010). Economically brucellosis may decrease foreign currency in flow as it affects export of live animals and meat among countries (Girmay *et al.*,2013). Brucellosis is a contagious disease of livestock and of great health importance as humans are infected by animal's brucellosis by drinking raw milk or eating unpasteurized cheese (Celebi *et al.*,2007).Several serological tests are used for diagnosis of brucellosis and Rose Bengal Plate Test(RBPT) is one of these tests, based on test-agreement analysis by KABA Test , all RBPT negative sera were CFT negative(Tizard,2009).

The objectives of this research work was to reflect the health condition of some livestock presented to the TVH., College of Veterinary Medicine, University of Bahri.

Materials and Methods:

Animals and Area: A total of 384 different animals (158 cattle,45 sheep,142 goats one donkey and 38 camel) were presented with some health problems to the Teaching Veterinary Hospital (TVH) College of veterinary Medicine , University of Bahri, Khartoum North during the period of 1st- 31st /January/2018. Blood, fecal and milk samples were taken for the diagnosis.

Sampling and Testing: Five ml of blood were taken from the jugular vein of each animal, blood smears were prepared and stained by Giemsa for blood parasites(Kassa *et al.*,2016). Serum samples were obtained for brucella using Rose Bengal plate Test(RBPT)(Morgan *et al.*,1969,OIE,2009).Milk samples were taken for detection of mastitis using California Mastitis Test(CMT) (Schalm *et al.*,1971).Fecal samples were also taken for detection of different internal parasites using techniques described by Soulsby (1986).

Results:

Out of the total number (201) of blood smears examined for BPs (132) were positive (65.67%) ,generally cattle represented the higher infection rate amongst the positive cases ,62(46.97%). Compared to other BPs , theileriosis had the higher values 93 out of the positive cases(70.45%) .Compared to other species, cattle reported the highest value (51.61%) for the incidence of theileriosis followed by sheep (19.35%) ,goats, (16.12 %) and camels,(12.90%).The incidence of babesiosis and anaplasmosis were, 27 (20.45%) and 12 cases (9.09%)respectively (Table1,Fig.1).

Table (1)The prevalence of blood parasites infestation amongst examined animals ,TVH.

Samples Total Number	Cattle	Sheep	Goat	Camel	Total
Babesia	11 (12.35%)	2 (7.14%)	5(11.11%)	9(23.68%)	27(20.45%)
Theileria	48(53.93%)	18 (64.28%)	15(33.33%)	12(2.63%)	93(70.45%)
Anaplasma	3 (3.37%)	6 (21.42%)	3(6.66%)	0	12(9.09%)

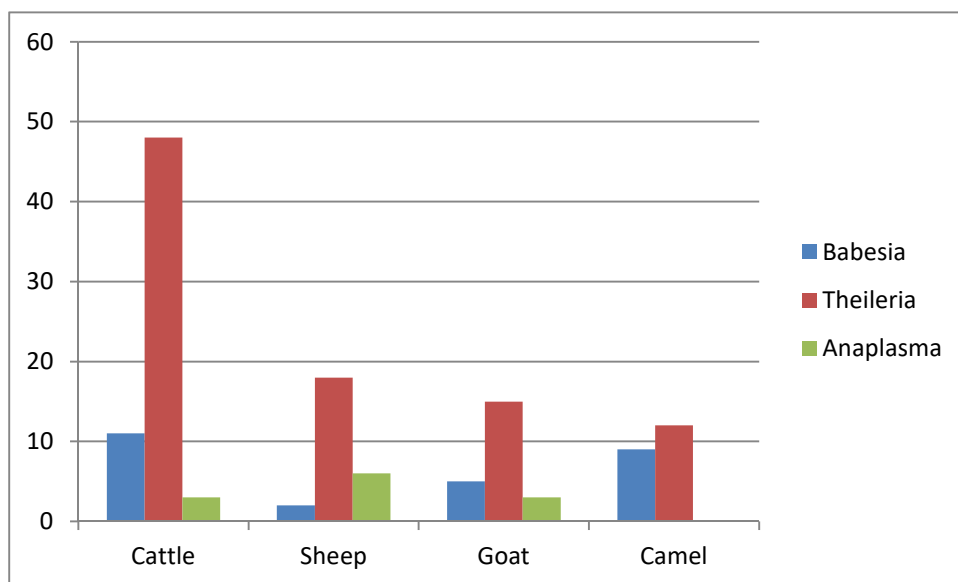


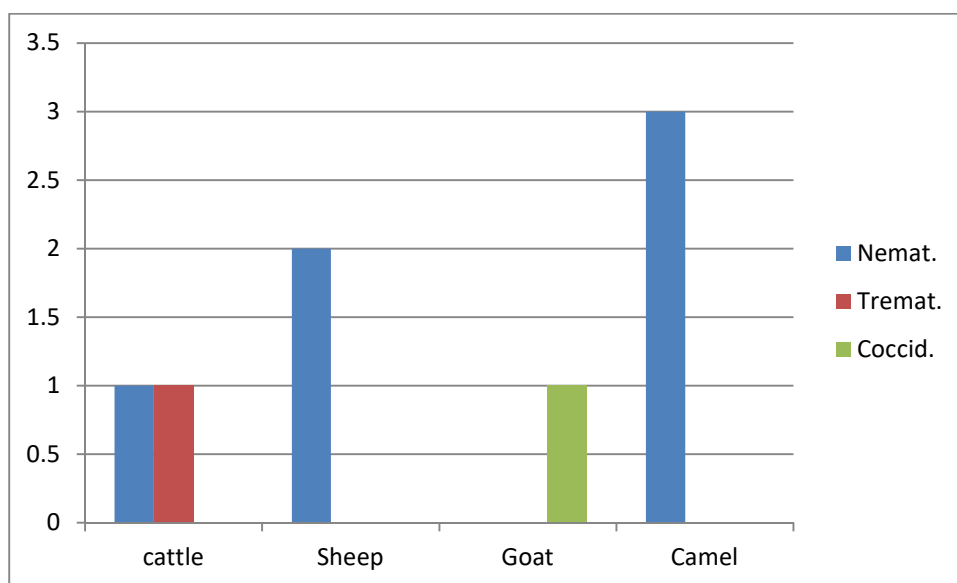
Fig.1 The prevalence of blood parasites infestation amongst examined animals.

Thirty five fecal samples were examined for INP out of which only 8 (22.86%) were positive. The result obtained for INPs prevalence were nematodes,(17.14%) trematodes (2.86%) and coccidia (2.86%) (Table 2, Fig.2).

Table (2) The prevalence of internal parasites infestation amongst examined Animals ,TVH.

Internal parasites	Cattle	Sheep	Goat	Camel	Total
Samples Total Number.	7	6	3	19	35
Nematodes	1 (14.29%)	2 (33.33%)	0	3(15.78)	6(17.14%)
Trematodes	1(14.29%)	0	0	0	1 (2.86%)
Coccidia.	0	0	1 (33.33%)	0	1(2.86%)

Fig.2. The prevalence of internal parasites infestation amongst examined Animals.



Only five cows were presented to the clinic with udder affections out of which 4 were positive to California Mastitis Test (80%) (Table 3).

Table(3.) The prevalence of mastitis amongst examined animals,TVH.

	Cattle	Sheep	Goat	Camel	Total
Samples Total Number.	5	0	0	0	5
Positive cases	4 (80%)	0	0	0	4

A total of 169 serum samples were examined for BRc and 5 (2.96%) were only positive where cattle represented the majority 4 (80%) while in goats it was an only one case (0.59%) (Table 4, Fig.4)

Table(4). The prevalence of brucellosis amongst examined animals ,TVH.,

	Cattle	Sheep	Goat	Camel	Total
Samples Total Number.	54	5	91	19	169
Positive cases	4 (7.41%)	0	1(1.09%)	0	5

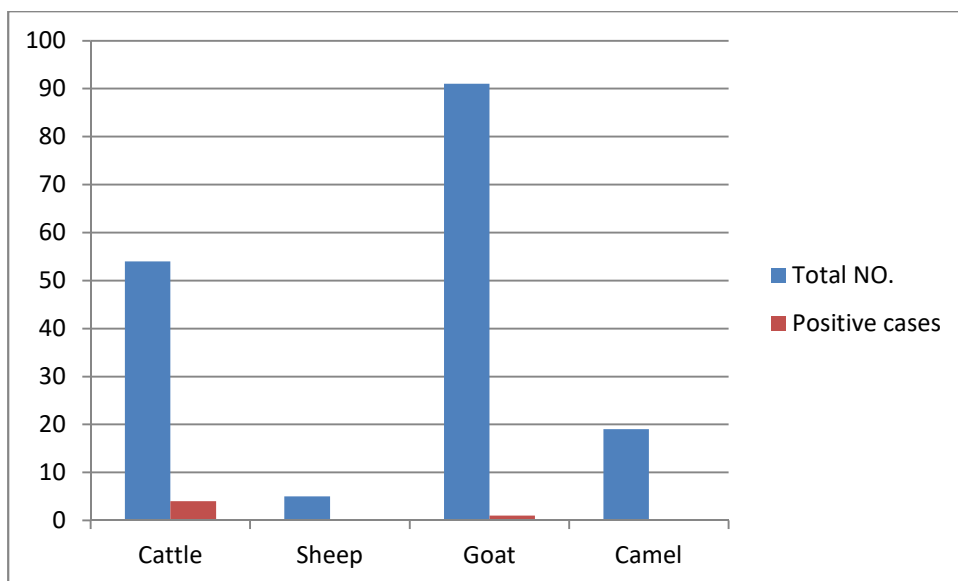


Fig.4. The prevalence of brucellosis amongst examined animals ,TVH

Discussion:

In this study, animals presented to the TVH reflected some health problems associated with animals hygiene and management in the field. Theileriosis was the most common blood parasites disease reported and cattle showed the highest value of incidence (51.8%) followed by goats (25%). This could be related to the bad hygiene in the small house hold farms and the poor efforts of tick control . Similar results were reported by Rohaya *et al.*,(2017). Blood protozoan infections can be controlled by prophylactic treatment by vector control and breeding genetically resistant breeds, applying a compulsory dipping policy as well as proper management, nutrition and avoidance of climatic stress factors.

Gastro-intestinal parasites are widely spread in many countries ,their prevalence varies depending on level of agriculture , pasture, management ,climatic conditions immunological and nutritional status of the host, presence of intermediate host and vectors(Tariq *et at.*,2010). In animals examined for INP the overall positive cases represented 28% of the examined animals , compared to other findings of a previous retrospective study in the TVH(Mohammed,*Personal communication*) this value is low due to winter season where during summer humidity increases the incidence of INP as North Bahri is rich in agricultural areas .Nematodes infection was the predominat,66.7% and 33.3% in cattle and goats respectively . Similar results were reported by Sulieman *et al.*(2017).

All cases presented

with udder problems were positive to CMT. The majority of the positive cases were in goats(92.9%) followed by (7.1%). This could be related to the association of mastitis with the physiological changes during pregnancy or to the bad hygiene and management after giving birth. Similarly high incidence of caprine mastitis was reported by Bourabah *et al.*(2013).

In this study RBPT was used in brucella diagnosis in the TVH laboratory as it is widely used , easy to be applied, cheap and rapid (Morgan *et al.*,,1969).The RBPT detects IgG and IgM isotypes in bovine, sheep and goat sera and diagnose the acute and chronic forms of the disease(WHO,1993). The total number of positive cases of brucellosis were small (5cases)compared to a previous retrospective study performed in the TVH(Mohammed,*Personal communication*) this could be related to the short period of the study .Cattle represented the majority of the cases(4 cases,80%),which is associated with abortion conditions followed by goats(one case,20%) these findings agree with what was reported by Omer *et al*(2007) . No positive cases of brucellosis were reported in ovine in this study as there was no cases of

abortion reported and examination of sera for brucellosis is done mainly for exporting purposes which undertaken in the quarantine. Girmay *et al.*, (2013) reported 0.8% in export sheep examined by RBPT. However, 74% were reported by Osman *et al.*, (2012) in Khartoum State.

As a conclusion, the data obtained from laboratory records revealed that ruminants suffer from different health conditions that retard their productive and reproductive performance. Blood and internal parasites, mastitis and brucellosis represent some of these critical health conditions and have great impacts on humans life, welfare and health. These diseases are one of the major constraints that hinder the industry of animal and their byproducts export. Application of hygienic measures, proper farms management in addition to vaccination programs of animals against these diseases will secure animals' life and performance.

Acknowledgements:

Our thanks and gratitude are to Mr. Alrashid Abbass the chief technician of the Laboratory of the TVH and his co-workers for the great assistance.

References:

- 1. Adam, I.M.M. (2007).** Mastitis, In Dairy Cows And its Economic Implication In The River Nile State (SUDAN). A Thesis submitted to fulfill the requirements of the Ph.D. in veterinary science, Department of preventive medicine and public health, University of Khartoum, Faculty of veterinary medicine
- 2. Abu Damir, H., Tageldin, M.H., Kenyon, S.J. and Idris, O.F. (1984).** Isolation of *Brucella abortus* from experimentally infected dromedary camels in Sudan: A preliminary report. *Vet. Res. Commun.*, 13, 403-409.
- 3. Bennet, S.G. (1943).** Annual Report of the Sudan Veterinary Service. 29-30.
- 4. Bourabah, A. Ayad, A. Boukraa, L. Hammoudi, S.M. and Benbarek, H. (2013).** Prevalence and Etiology of Subclinical Mastitis in Goats of the Tiaret Region, Algeria, *Global Veterinaria* 11 (5): 604-608
- 5. Chandrawathani P., Tsuji N., Kawazu S., Ishikawa M. and Fujisaki K. (1994).** Sero epidemiological Studies of *Bovine babesiosis* caused by *Babesia ovata*, *B. bigemina*, and *B. bovis* in Peninsular Malaysia. *J. Vet. Med. Sci.* 56(5): 929-932.
- 6. Celebi, Kulah, C. Kilic, S. and Ustday, G. (2007).** Symptomatic *Brucella* Bacteremia and Isolation of *Brucella melitensis* biovar from human breast milk. *Scana, J. Inec. Dis.* 39: 205-208.
- 7. Devendra and Burns, M., (1970).** Goat production in the tropics. Commonwealth agricultural bureaux, Farnham royal bucks. England.
- 9. FAO. (1985).** Small ruminant production in the developing countries.
- 10. <http://www.fao.org/docrep/009/ah221e/AH221E13.htm#ch13>.**
- 11. Grimawy, A., Hussien, D. and Afera, B.B. (2013).** Sero-prevalence of Ovine Brucellosis in a sheep export farm, Ethiopia, *Global Veterinaria*, 11: 325-328.
- 12. Ishag, I.A and Ahmed, M.K.A (2011).** Characterization of Production System Of Sudanese Camel Breeds. *Livestock Research for Rural Development*, 23(3), 1-18
- 13. Kaplan, R. M., (2004).** Drug resistance in nematodes of veterinary importance. a status report. *Trends in Parasitology*, 20: 477-481
- 14. Kassa, D., Mengestie A., Ayalew, N., Belaynew, A., Mebric, Z. and Metadel, T. (2016).** A review On Diagnostic Techniques in Veterinary Helminthology. *Nature and Science* :4(7): 109-118.

- 15. Las Heraz, A., Dominguez, A. and Fernandez-Garayzabal, J.F. (1999).** Prevalence and Etiology of Subclinical mastitis in dairy ewes of the Madrid region. *Small Ruminant Res.*, 32:21-29.
- 16. Levine N.D. (1985).** Veterinary Protozoology. Iowa State University Press, Ames
- 17. Lughano, K. and Dominic, K., (1996).** diseases of small ruminants in sub-saharan Africa. Handbook. VETAID, Centre for Tropical Veterinary Medicine. Department of Veterinary Medicine and Public Health Sokoine University of Agriculture Morogoro, Tanzania.
- 18. Mavrogianni, V.S., Menzies, P.I., Fragkou, I.A. and Fthenakis, G.C. (2011).** Principles of Mastitis Treatment in Sheep and Goat. *Vet. Clinic. Food Animal Practice*. Vol.(27), issue 1, pp:115-120.
- 19. Morgan, W.J.B, Mackinnon, D.J., Lawson, J.R. and Gullen, G.A. (1969).** The Rose Bengal Plate Agglutination Test in The Diagnosis Of Brucellosis., *Vet. Rec.*, 85:636-641.
- 20. OIE, (2000)** Manual of Standards for Diagnostic Tests and Vaccines, 4th ed. Office International de Epizooties, Paris, pp:475-481.
- 21. OIE. (2009)** Bovine Brucellosis. Manual of Diagnostic Test and Vaccines for Terrestrial Animals. Office International des Epizooties, Paris. pp:1-35.
- 22. Omer, M.M., Abdelaziz, A.A., Abusalab., M.A.S and Ahmed A.M. (2007).** Survey Of Brucellosis among Sheep, Goats, Camels and Cattle in Kassla Area, Eastern Sudan. *J. AniM., and Vet. Adva.*, 6(5):635-637.
- 23. Omer, M.M., Musa, M.T., Bakhiet, M.R. and Perrett L. (2010):** Brucellosis in camels, cattle and humans: associations and evaluation of serological tests used for diagnosis of the disease in certain nomadic localities in Sudan. *Rev. sci. tech. Off. int. Epiz.*, 29 (3), 663-669
- 24. Osman, M.A. and A.E. Abdelgadir, (2012).** Detection of Brucellosis in sheep intended for export and local slaughter in Khartoum State, Sudan. *African Journal of Microbiology Research*, 6(39): 6805-6810
- 25. Perry, B.D., Randolph, T.F., McDermott, J.J., Sones, K.R. and Thornton, P.K., (2002).** Investing in animal health research to alleviate poverty. ILRI (International Livestock Research Institute), Nairobi, Kenya.
- 26. Robertson, A. (1976).** Handbook On Animals Diseases In The Tropics. London, The British Veterinary Association.
- 27. Schalm, O.W., Carroll, E.J. and Jain, N.C. (1971).** Bovine Mastitis. Lea and Febiger. Philadelphia.
- 28. Soulsby, E. J. L., (1982).** Helminths, Arthropods and Protozoa of Domesticated animals, 7th Edition. The English Language Book Society and Ballière Tindall, London.
- 29. Soulsby, E.J.L., (1986).** Helminths, Arthropods and Protozoa of Domesticated animals 7th Edition. Bailliere, Tindall and Cassell, London.
- 30. Soulsby, E. J. L. (2007):** Helminths, arthropod, and protozoa of domesticated animals. 7th ed. Bailliere. Pp. 203. 29.

- 31. Sulieman,Y; Ibrahim,S.O; Eltayeb ,R.E;Afifi,A.;Zakaria,M.A and Khairala,M.A(2017)** .Gastointestinal Helminth Parasites Of Ruminants Slaughtered in Shendi Abattoir ,River Nile,Sudan.,*J.Coastal Life Medicine* ,5(6):249-253
- 32. Rohaya,M.A.I , Tuba Thabita ,A.T., Kasmah S.1, Azzura L.I., Chandrawathani P. and Saipul, B. A.R. (2017).**Commonn Blood Parasites Diagnosed in Ruminants From 2011 to2015 At The Central Veterinary Laboratory ,Sepang ,Malaysia, *Malaysian Journal of Veterinary Research*, Volume 8 No. 1 , pages 163-167
- 33. Tariq K, Chishti M, Ahmad F.(2010)** Gastro-intestinal nematode infections in goats relative to season, host sex and age from the Kashmir valley, India.*J. Helminthol.* , 84: 93-97.
- 34. Tizard, I.R., 2009.** Veterinary immunology: introduction. 8th ed. Mo: Saunders Elsevier, St. Louis,pp: 87-88.
- 35.Zajac, A., and Gipson, T., (2000).** Multiple anthelmintic resistance in goat herd.*Veterinary Parasitology*, 87: 163-172.
- 36.WHO.(1993).**Report of MZCP Training Course The Establishment Of Human And Animal Brucellosis National Surveillance System.Heraklion,Greece.
- 37. Wilson ,R. T. (1984)** The camel. Longman group limited, Essex, U.K. 158-159.