دراسة الانتشار المصلى لمرض البر وسيلة في الحيوانات المجترة في مناطق غرب ليبيا

أ. محمد السوري الجرمي، أسماء الطاهر الشريف، رويدة البشير الميساوي - كلية التربية الزاوية – جامعة الزاوية
أ. انتصار علي محمد التومي – كلية العلوم صبراتة – جامعة صبراتة

ملخص البحث :

يُعتقد أن مرض البروسيلة الحيواني موجود في المجترات الصغيرة والأبقار والإبل في ليبيا ، خاصة في الشريط الساحلي الغربي. تم فحص العينات بحثًا عن الأجسام المضادة لـ Broucella باستخدام اختبار .Rose Bengal أظهرت النتائج أنه من أصل 3147 حيواناً مختبراً سجلت نسبة الإصابة 13.1% في الأغنام (العدد = 1640) أي 15.5% في الماعز (العدد = 1450) و 62.5٪ في الإبل (العدد = 40) و 47% في الأبقار. (n=17). أعلى نسبة إصابة للذكور سجلت في الماعز (8.00%). بينما سجلت أعلى نسبة إصابة في أناث الأبقار (12.5٪). بينما سجلت أعلى نسبة إجهاض في النعاج (93%). يبدو أن نسبة الإصابات مرتفعة. في ذكور الأغنام سجلت (7%) و (93%) في الإناث بينما سجلت في الماعز (8%) للذكور (92%) للإناث. يمكن اعتبار الإنتشار في الإبل والأبقار فقط في الإناث حيث بلغ (80%) و (87.5%) في الإبل والأبقار على التوالي.

Study of the seroprevalence of brucellosis in ruminants in regions of western Libya

Abstract

Animal brucellosis is thought to be present in small ruminants, cattle, cows and camels in Libya, particularly in the west coastal strip The samples were screened for Broucella antibodies using the Rose Bengal test. Results showed that, out of 3147 tested animals, the percentage of infection recorded 13.1% in sheep (*n* = 1640), 15.5% in goats (*n* = 1450) , 62.5% in camels (*n* = 40), and 47% in cows (*n* = 17). The highest percentage of infection in males recorded in goats (8.00%). While the highest percentage of infection in

females recorded in cows (12.5%). The highest percentage of abortion recorded in ewes (93%). the percentage of infections seems to be high. in males in sheep recorded (7 %) and (93%) in females while, In goats it recorded (8%) in males and (92%) in females. prevalence in camels and cow could be considered only in females recording (80%) and (87.5%) in camels and cows respectively.

Introduction

Brucellosis is one of the world's major zoonotic problems. Though it has been eradicated in any developed countries in Europe, Australia, Canada, Israel, Japan and New Zealand (3), it remains an uncontrolled problem in regions of high endemicity such as the Africa, Mediterranean, Middle East, parts of Asia and Latin America Almost all might domestic species can be affected with brucellosis except cats which are resistant to Brucella infection (11). The World Health Organization considers it as a neglected zoonosis, because adequate control programmes were not in place in numerous countries despite its huge impact on human and animal health, also on the economy (13). Brucellosis is a disease of domestic, livestock and wild animals with serious zoonotic implications in man; causing huge economic losses to the livestock industry. Cattle, goats, pigs, sheep, horses and dogs play an important role in the transmission of this disease to man. It is defined as a contagious systemic bacterial disease primarily of ruminants, characterized by inflammation of the genital organs and fetal membranes, abortion, sterility and formation of localized lesions in the lymphatic system and joints (14-15). Brucellosis due to *Brucella melitensis*causes reproductive wastage and reduced milk production in affected livestock and is an important zoonosis. The disease in human beings is serious and long lasting and often results in chronic and disabling symptoms (6). Moreover *Brucella abortus* infection in cattle resulting a huge economic losses due to decreased calving percentage, delayed calving, culling for infertility, cost of treatment, decreased milk production, abortions, stillbirth, birth of weak calves and loss of man-hours in infected people (7). The infection of Brucellosis is reported to be widespread in some countries including Ethiopia (8) Sudan (9), Djibouti (10), Saudi Arabia and Yemen (4). On the other hand Brucellosis prevalence varies very widely in equine (0.24-37.50%), bovine (0.58-35.90%), caprine

(0.40- 33.3%), ovine (0.28-16.70%) and camelidae (1.8-7.48%), while humans had the least prevalence (0.89- 4.10%). Brucellosis is essentially a disease of the sexually mature animals, as organism resides in gravid uterus where erythritol is synthesized in placenta and stimulates the growth of virulent strains of *Br. Abortus* (18). (12) studied The prevalence of *Brucella melitensis* in camel in Libya. The positive sera was 4.1 per cent. Samples collected for cultural examination revealed 9 isolates. Five isolates were from milk samples, 3 from aborted foetuses and one from a vaginal swab. All isolates were identified and biotyped as *Br. melitensis* biovar. (16) in Nigeria surveyed the brucellosis in livestock animals in Southwestern Nigeria between May and August 2004. A total of 1,210 cattle, 54 sheep, 496 goats, 200 pigs . were screened using the Rose Bengal test (RBT).From the results, prevalence in trade cattle was 5.82% while 0.86% was recorded in goats. None of the sheep and pigs was positive to the test. (17) investigated a total of 1612 serum samples, collected opportunistically from 29 herds in 12 different localities in the northwest region of Libya, for brucellosis and found that, seropositivity in goats (33.4%) and sheep (9.2%). The overall percentage of brucellosis seropositivity was 21%. The high level of brucellosis identified particularly in small ruminants, strongly suggests re-emergence of the disease in the region.

Materials and methods

Study area:

The study was carried out in nine regional locations which were, badr , hamda , alshebeka , alakrabia , aljmil , alheblya , alzerer , regdalin ,and zolton in western Libya..Animals*:* A total of 3147 animals sheep (1640) ,goats (1450) , camels (40) , and cow (17) were sampled for stereological test.

sampling.

Approximately 3–4 mL of blood was collected from jugular vein using plain vacutainer tubes and needles. Individual tubes were identified using numbers and alphabets to indicate their location and source. The tubes were left tilted overnight at room temperature to allow clotting. The sera were separated from the clot (unretract blood centrifuged) by siphoning into sterile test tubes. The 3147 serum samples were transported in icebox to the

Veterinary laboratory in Aljmil and stored at –20 C° until Rose Bengal Plate Test (RBPT) was carried out using standard techniques. Rose Bengal plate test. It was carried out using standard Rose Bengal Plate Test antigen obtained from according to the method of Alton *et al.* (1975). Equal volumes (0.03 mL) of antigen and test serum were mixed thoroughly on the glass plate of the test box using a tooth pick and the box was hand rocked for 4 min. Samples that showed signs of agglutination were recorded as positive while those with no sign of agglutination were recorded negative.

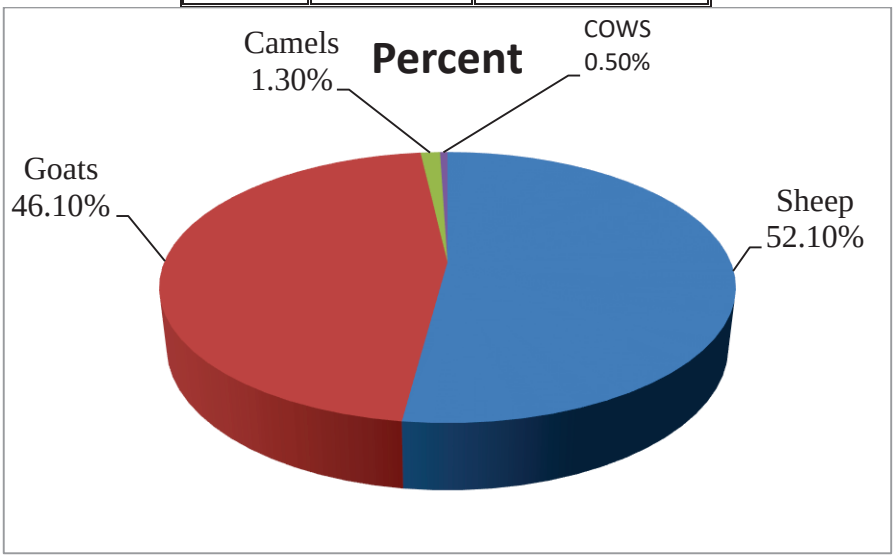
RESALT:

Table Recurring graph below shows the Total animals examine

(cows - camels - goats - sheep) by species of Workbook study sample

Table (1): shows the total animals examine .

Percent	Frequency	the animals
52.10%	1640	Sheep
46.10%	1450	Goats
1.30%	40	Camels
0.50%	17	Cows
100%	3147	total summation



Animals classified by type of percentage the shows Figure (1)

which , sheep animals of Almost 52% clear that it is (1) From Figure which stood at , goat ratio highest proportion, followed by represents the approximately 46%

The repetitive table and the following diagram shows the percentage of Animals affected by the disease.

. Table (2)

Percent	Frequency	the animals
15.06	474	Infected
84.94	2673	Not infected
100.00	3147	Total

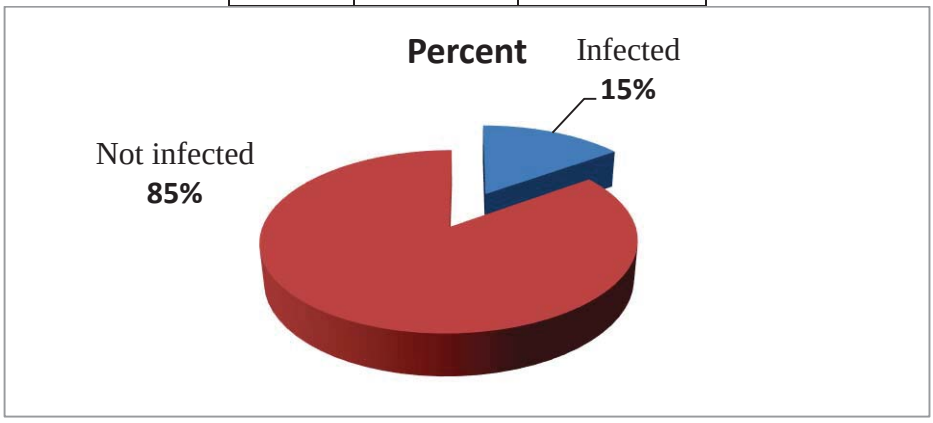


Figure (2) shows the percentage of animals classified according to infection

From Figure (1) it is clear that 15% Almost from animals infected with the disease, while we find that 85% almost no infected , according to the sample data.The repetitive table and the following diagram shows the percentage of sheep infected with the disease

Sheep	Male	Female	Total
Of Suffering	15	200	215
	25%	12.7%	13.11%
Infected Non of	45	1380	1425
	75%	87.3%	86.89%
Total	60	1580	1640

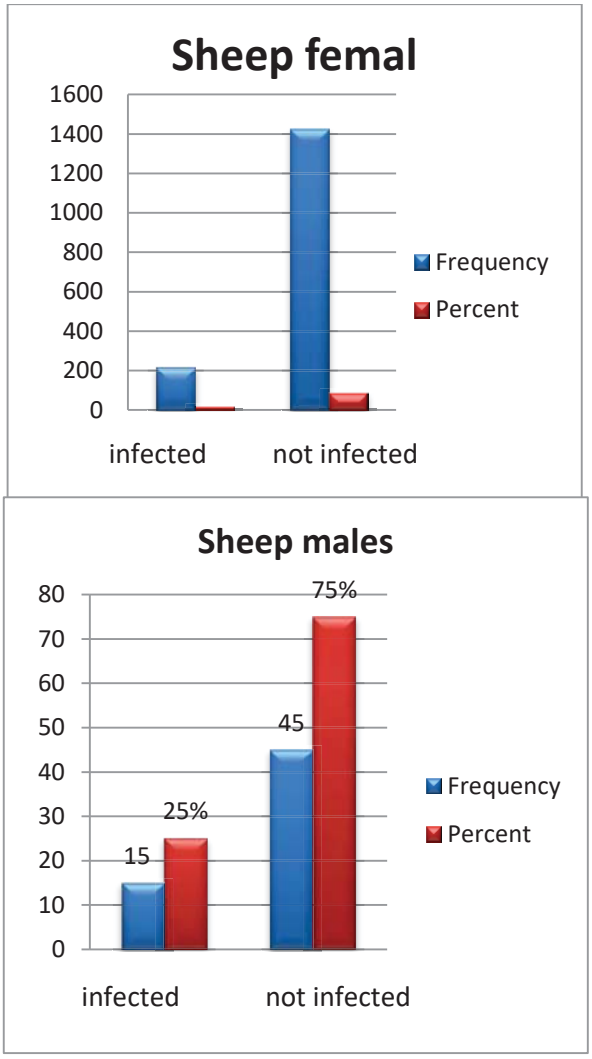


Figure (3) shows the percentage of infected sheep and the percentage of infected males

From Figure (3) it is clear that approximately13.11 % of the sheep are infected with the disease from the total sheep , while we find that 25 % of the males are infected with the disease out of the total males , which is equivalent to a quarter of the males with the disease according to the sample data

The repetitive table and the following diagram show the percentage of Goats infected with the disease.

Goats	Male	Female	Total
of Suffering	18	208	226
	31.03%	14.9%	15.6%
Non of infected	40	1184	1224
	68.97%	85.1%	84.%
Total	58	1392	1450

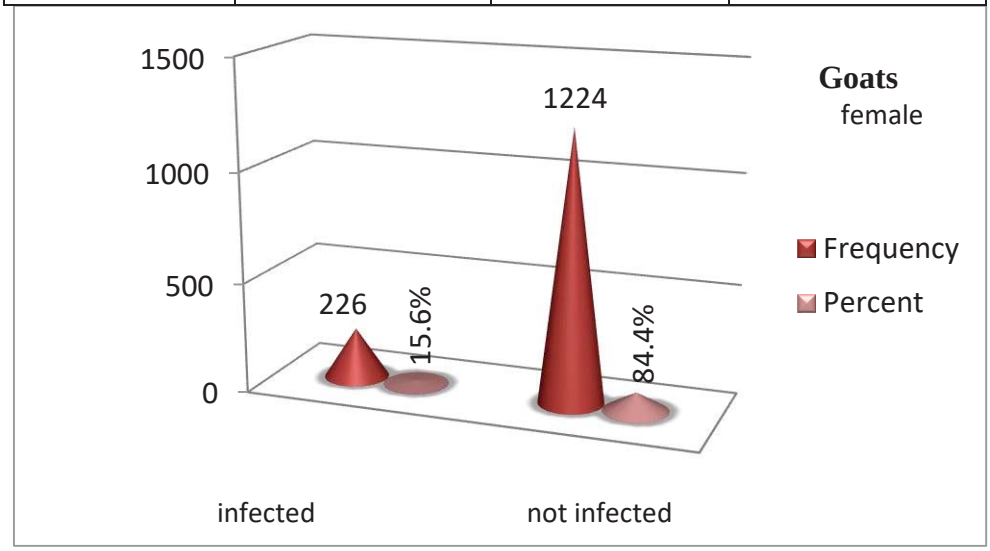


Figure (4) shows the percentage of goats infected and the proportion of males infected

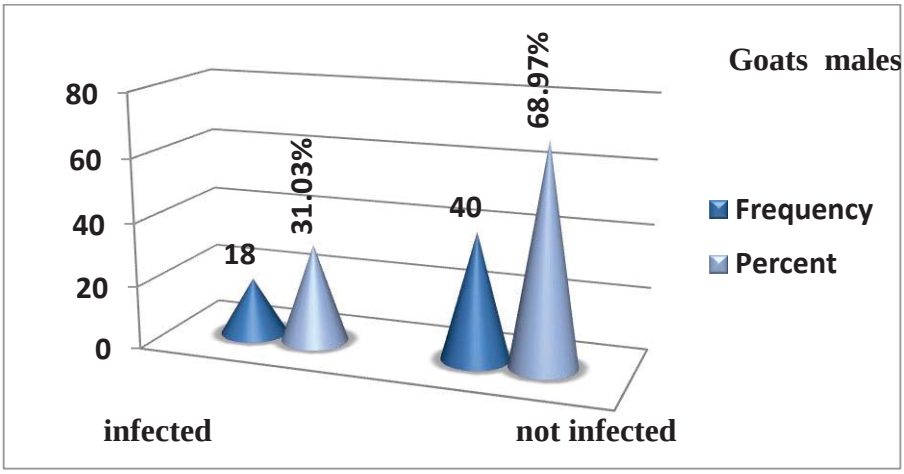
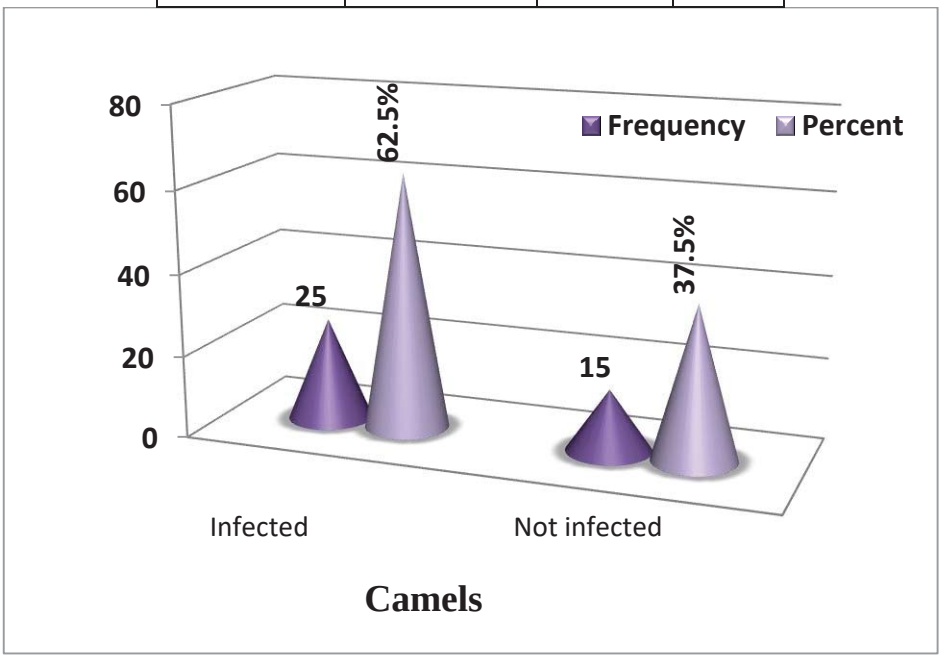


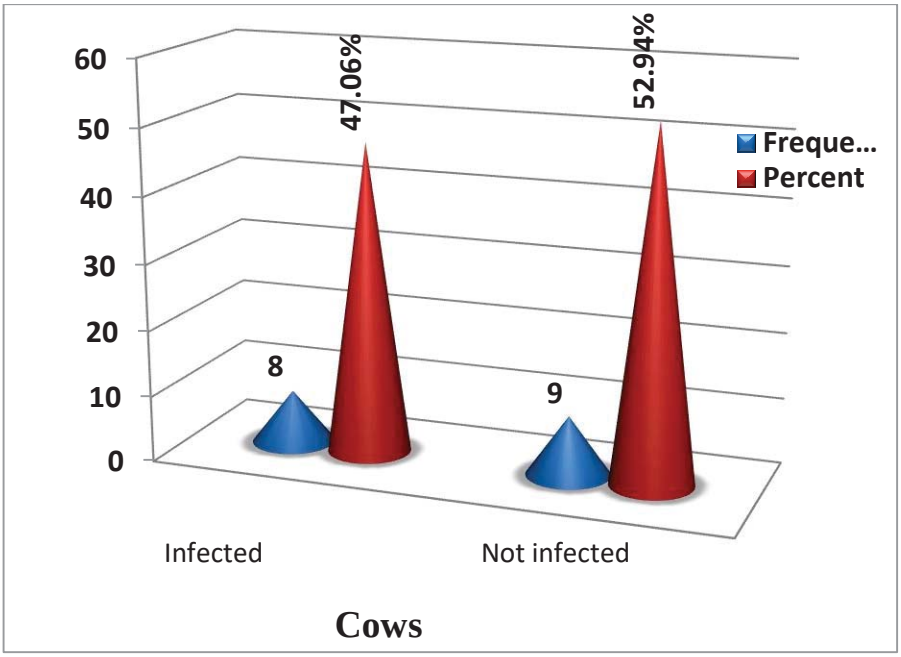
Figure (4) illustrated that 15 % approximately of the goats infected with the disease of the total of the goats, while we find that 31 % almost males

infected with the disease of total males, no more than a quarter of infected males of the disease , according to the sample data.

Table Recurring The graph below shows the ratio of the Apple - cows infected with the disease .

injury	The Camels	Cows	Total
Infected	25	8	33
	% 62.5	% 47.06	%15.6
Not infected	15	9	24
	% 37.5	% 52.94	%84.4
Total	40	17	57



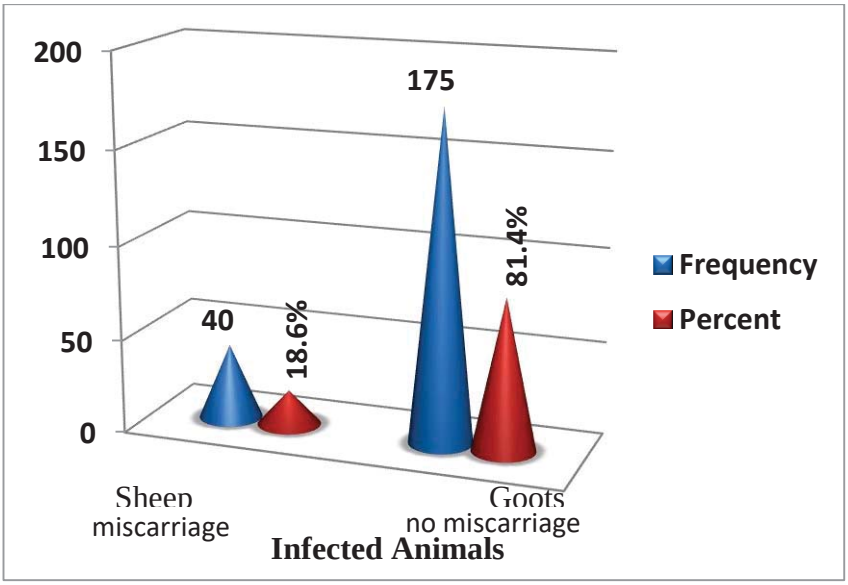


Form (5) shows the percentage camels - cows infected

From Figure (5) it is clear that approximately 62.5% of camels are infected with the disease from the total camels, while we find that approximately47% of the cows are infected with the disease from the total cows, according to the sample data .

The frequency table (6) and the following diagram shows the abortion rate for animals with the disease.

Animals	miscarriage	No miscarriage	Total
Sheep	40	175	215
	18.6%	81.4%	45.35%
Goats	46	180	226
	20.35%	79.65%	47.68%
The Camels	2	23	25
	8.0%	92.0%	5.3%
Cows	1	7	8
	12.5%	87.5%	1.69%
Total	89	385	474



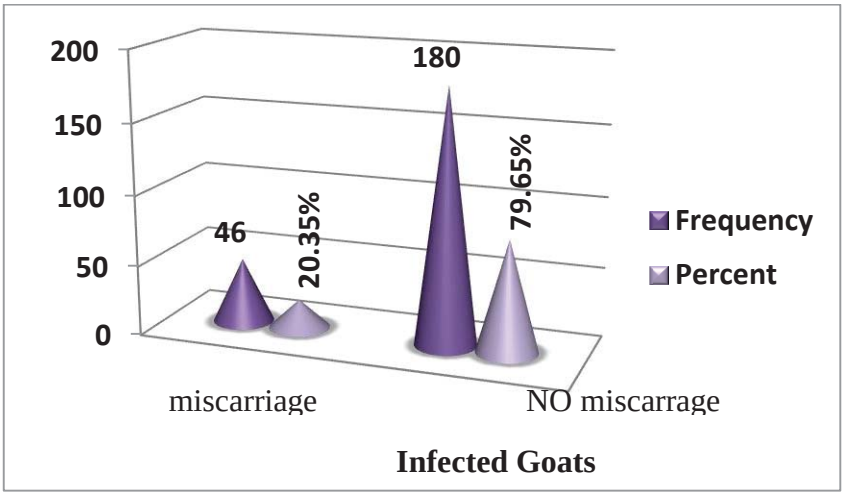


Figure (6) shows the percentage of abortions of infected sheep and goats Figure 6 is clear that 18% almost from the sheep of the infected occur have abortions , while we find that 20% almost from the goats of the infected talked to him abortions , according to the sample data .

discussion

A total of 3147 samples were collected and analyzed from 9 herds distributed over 7 provinces in the northwest region of Libya, and provided clear evidence of the ongoing presence of brucellosis.

As shown in Table (1) the percentage of brucellosis cases among different animal species in the north west region of Libya. The percentage of infection recorded 13.1% in sheep (*n*= 1640), 15.5% in goats (*n*= 1450) , 62.5% in highest in camels (*n*= 40), and 47% in cows (*n*= 17). It could be seen that, the rate of brucellosis seropositivity varied among the four species. the percentage of infection was the highest in cows compared with other surveyed animals. the proportion of seropositive cases appeared to be high in this study compared with a previous studies undertaken in Libya. Data presented by Al-Griw (2017) suggested that, the highest percentage of infection recorded in goats was 33.4%. It still very high compared with our finding. Moreover (1) reported that, although brucellosis has continued to be present in Libya , the incidence of the disease did not exceed 0.2% in cattle, 0.1% in camels, and 14.8% in sheep and goats. It should be bear in mind that, brucellosis among different animal species in the northwest region of Libya have been increased because no safety veterinary heath consideration measurements such as vaccinations and routine investigations are applied since 2011.

Table 1: Prevalence of *brucellosis* in livestock in different animal species

Species	N	infected	% percentage of infection
Sheep	1640	215	13.1%
Goats	1450	226	15.5%
Camels	40	25	62.5%
Cows	17	08	47%
Total	3147	474	

Table 2: number and percentage of parasitism in sheep, goats, camels and cows

Species	infected	Of infection%	infected	of infection %	Aborted	of abortion%
Sheep	15	7%	200	93%	40	18.6%
Goats	18	8%	208	92%	46	20.35%
Camels	5	25%	20	80%	2	8%
Cows	1	12.5%	7	87.5%	1	14.28%
Total	39		435		89	

As shown in table (2) the highest percentage of infection in males recorded in goats (8 %). While the highest percentage of infection in females recorded in cows (87.5 %). The highest percentage of abortion recorded in ewes (18.68%).

With regard to the previous data, we cannot depend on the percentage of infection recorded in camels and cows because only one case was available for each. More over the number of males was very low compared with females so, the percentage of infections seems to be high. Infection in males in sheep recorded (7 %) and (18.6%) in females while, In goats it recorded (8%) in males and (20.35 %) in females. prevalence in camels and cow could be considered only in females recording (80 %) and (87.5%) in camels and cows respectively. According to (5) prevalence in sheep was 6.1% in females and 3.1 in males, despite these rates are low compared with our finding but infection in females seems to be supporting our data, we cannot role out the variation in climatic conditions between Libya and Kosovo, mating season in cattle in Libya is synchronized with a high air temperature that may enhance the distribution of the pathogen. While the percentage of prevalence in goats recorded high rates of infection in females compared with males so, these results differ form those of (5).

Conclusion :_

From this study the rate of infection at the western area in Libya within the normal average.

References

1. Elgnay F, Mohammed Z.(2009) Seological study of brucellosis in livestock animals in Libya.. Report 59–1, National Cener for Animal Health (NCAN), Ministry of Agriculture, 2009.
2. Alton, G.G ; L. M. Jones and D. E. Pietz, (1975). Laboratory Techniques in Brucellosis, World Health Organisation monograph series No. 454, Geneva.
3. Geering, W. A., J. A. Forman. and M. J. Nunn, (1995). Exotic Diseases of Animals. Aust. Gov. Publishing Service, Canberra, Australia, pp: 301-306.
4. Hosie BD; Al-Bakri OM, Futter RJ (1985). Survey of brucellosis in goats and sheep in the Yemen Arab Republic: comparison of tests for *Brucella melitensis* infection in sheep. Trop Anim Hlth Prod 1985; 17: 93±9.
5. R. Jackson, L. Pite, R. Kennard, D. Ward, J. Stack, X. Domi, A. Rami, I. Dedushaj (2017). Survey of the seroprevalence of brucellosis in ruminants in Kosovo. Veterinary Record (2004).154, 747-751.
6. Taleski V; Zerva L; Kantardjiev T, Cvetnic Z, Erski-Biljic M, Nikolovski B, Bosnjakovski J, Katalinic-Jankovic V, Panteliadou A, Stojkoski S, Kirandziski T.(2002) An overview of the epidemiology and epizootology of brucellosis in selected countries of Central and Southeast Europe. *Veterinary Microbiology* 90, 147-155.
7. McDermott JJ, Arimi S.M .(2002): Brucellosis in sub-Saharan Africa; epidemiology, control and impact. Vet Microbiol, 90:111–134.
8. Domenech J.(1977). Serologic survey of brucellosis of the dromedary in Ethiopia. Rev Elev Med Vet Pays Trop 1977; 30: 141±2.
9. Musa MT, Jahans KL and, Fadalla ME (1990). Clinical manifestations of brucellosis in cattle of the southern Darfur Province, western Sudan. J. Comp. Pathol. 1990; 103: 95±9.
10. Gavazzi G, Prigent D, Baudet JM, Banoita S and, Daoud W (1997). Epidemiologic aspects of 42 cases of human brucellosis in the Republic of Djibouti. Med Trop 1997; 57: 365±8.
11. Refai, M., (2002). Incidence and control of brucellosis in the Near East region. Vet. Microbiol., 90: 81-110.
12. Gameel, S. E., S. O. Mohamed, A. A. Mustafa and S. M. Azwai, (1993). Prevalence of camel brucellosis in Libya. Trop. Anim. Hlth. Prod., 25: 91–93.
13. Hannah R Holt., M. M. Eltholth, Y. M. Hegazy, W. F. El-Tras, A. A. Tayel and J. Gultian, (2011). *Brucella* spp. Infection in large ruminants in an endemic area of Egypt; crosssectional study investigation,

seroprevalence, risk factors and livestock owner's knowledge, attitudes and practice (KAPs). *BMC Public Health,* 11, 341, doi:10.1186/ 1471-2458-11-341.

14. World Health Organization. (1971). Joint FAOWHO Expert Committee on Brucellosis. Fifth report. World Health Organisation Technical Report Series. 464, 1-76.
15. CDC (2005). Brucellosis (Brucella melitensis, abortus, suis and canis). brucellosis_g.htm Accessed November 8, 2005. www.cdc.gov/ncidod/dbmd/diseaseinfo/
16. Cadmus S.I.B; Ijagbone I.F., Oputa H.E., Adesokan H.K., and Stack J.A (2006). Serological Survey of Brucellosis in Livestock Animals and Workers in Ibadan, Nigeria. African Journal of Biomedical Research, Vol. 9 (2006); *163 – 168*.
17. Al-Griw . Huda H; Elfurgani Salem Kraim, Milad E. Farhat, Lorraine L. Perrett, Adrian, M., and Whatmore (2017). Evidence of ongoing brucellosis in livestock animals in North West Libya. Journal of Epidemiology and Global Health 7 (2017) 285–288.
18. Gul S. T., and A. Khan (2007). epidemiology and epizootology of brucellosis: a review. Pakistan Vet. J., 27(3): 145-151.