

## Seroprevalence of cattle brucellosis by rosebengal and ELISA tests in different villages of Duhok province

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### Summary

The current study conducted in the Duhok province villages, Kurdistan region of Iraq during the period between September-December 2008, fulfilled by using Rosebengal and ELISA tests cattle of different sex and age were used comparing between these two tests and to determine the prevalence rate by both tests. A total number of 360 serum samples were collected (294 females, 66 males). The infected rate by RBT was 6.38% and by ELISA were 0.83%. According to the different animal ages and sex group showed that the infection rates were 5.4% and 12.1% in females and males, respectively. Cattle in age group 1-3 years and more than 4 years were showed that an infection rates were 3.8% and 11.8% respectively.

**KEY WORDS:** Brucellosis, serological tests for detection of brucellosis in cattle.

### دراسة وبائية مصلية لمرض حمى المالطا في الماشية بواسطة فحص الـروز بنكال والـايـزا في قرى مختلفة في محافظة دهوك

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### الخلاصة

اجريت الدراسة الحالية في عدة قرى تابعة لمحافظة دهوك /اقليم كردستان العراق للمدة الممتدة بين ايلول-كانون الاول 2008 وشملت فحص الـروز بنكال وأنزيم المناعي الممتز ( ELISA ) حسب عمر وجنس الحيوان. وتم اجراء المقارنة بين نتائج الطريقتين فضلا عن تحديد نسبة الاصابة اذ تم جمع 360 عينة مصل من ابقار قرى مختلفة في محافظة دهوك 294 انثى و66 ذكرا، وقد وجد ان نسبة الاصابة بواسطة فحص الـايـزا والـروز بنكال %0.83 و%6.38 على التوالي. كما كانت نسبة الاصابة في الاناث %5.4 وفي الذكور %12.1 وان نسبة الاصابة في الابقار التي تتراوح اعمارها ما بين 1-3 واكثر من 4 سنوات بلغت %3.8 التي %11.8 على التوالي.

### Introduction

Brucellosis is one of the major zoonotic problems in the world, and it has been eradicated in many developed countries in Europ, Australia, Canada and others (1), but remains an uncontrolled problem in regions of high endemicity such as Africa, Mediterranean, Middle East and other countries in Asia (2).

All domestic species almost can be affected with brucellosis except cats which are resistant to brucella infection. From the public health view point's brucellosis is considered to be an occupational disease that mainly affects slaughter-house workers, butchers, and veterinarians. Transmission and the disease typically occurs through contact with infected animals or materials with skin abrasions. Symptoms in human brucellosis can be highly variable, ranging from non-specific, flu-like symptoms (acute form) to undulate fever, arthritis, orchitis and epididymitis (3). There are many factors that can affect the prevalence of brucellosis in various species of livestock such as climatic conditions, geography, species, sex, age and diagnosis tests applied. The brucella may enter the body through digestive tract, lungs or mucosal layers and intact skin. Then it may spread through blood and the lymphatic system to any other organ where it infects the tissues and causes localized infection (4). The diagnosis of brucellosis relies on blood culture and serological tests, such as standard tube agglutination test (STAT), Coombs test, and ELISA (5). Yet brucellosis is more common in countries with poorly standardized animal and public health programs (6). The aim of present study includes: comparing between the results of rose bengal test and ELISA and determine prevalence rate of the disease according to some epidemiological factors like age, sex in different villages, Duhok province, Iraq.

### Material and Methods

This study was conducted in Duhok governorate, Kurdistan Iraq during the period from September-December 2008. A total of 360 peripheral blood samples were collected randomly from cattle vaccinated against brucellosis of 6 different villages were collected 60 blood samples in the Duhok province. In addition, Age and sex were broadly studied and tabulated. Blood samples were conveyed to the laboratory in Duhok veterinary directorate for centrifugation to obtain the sera. The tubes were placed in the centrifuge at 3000 r.p.m., for 5 minutes, then the sera were collected in small vials (cryogenic vials) and stored in a special freezer for deep freezing at -20 till the time of use.

Serological detection of Brucella antibodies *Brucella abortus* antigen used in the study for both RBT (The test was performed according to information provided with the antigen kit). And ELISA, [indirect ELISA] kits purchased from a commercial company\*.

### Results

Brucellosis is an infectious disease transmitted to humans through contact with infected animals or animal products (7, 8, and 9). The incidence of the disease has decreased markedly in industrialized countries; however, it remains a major public health problem in many developing countries (10, 11). In this study, from 360 sera, 23 (6.38%) were determined positive by RBT and 3 (0.83%) by ELISA (Table 1). A total of 294 sera collected from the females the infected rate was 16 (5.4%) and 66 males 8 (12.1%) were positive while in

ELISA out of 233 of the cattle sera 9(3.8%) were determined positive in the age group ranged between 1-3 years and 15(11.8%) out of 127 were positive of the age group more than 4 years. High infection rate occur in Deralok district in both male and female 30%, 18% respectively, but the lowest infection rate was (0%) were recorded in Bakrman village.

**Table 1: Seroprevalence of brucellosis in cattle of different areas around Duhok province**

Villages	Total No. of examined animals	No.of exa. females	Infected rate (females)	No.of exa. males	Infected rate (males)	Age groups Infection rate%		Tests	
						1-3y (%)	More than 4 year (%)	RBT* (%)	ELISA** (%)
Moasker muqbel	60	42	1 (2.38%)	18	0 %)(	27 (0%)(	33 1 (3.03%)	1 (1.66%)	0
Deralok	60	50	9 (18%)	10	3 (30%)	22 (0%)	38 12 (31.55)	12 (20%)	1 (1.66%)
Bakrman	60	46	0%	14	0%	24 (0%)	36 (0%)	(0%)	(0%)
Hashtka	60	50	1 (2%)	10	2 (20%)	48 2 (4.16%)	12 1 (8.33%)	3 (5%)	1 (1.66%)
Bamishmish	60	53	4 (7.54%)	7	2 (28.75%)	55 (+5) (9.09%)	5 (+1) (20%)	(+6) (10%)	(0%)
SOSI	60	53	1 (1.88%)	7	1 (14.28%)	57 (+2) (3.5%)	3 (0%)	(+1) (1.66%)	1 (1.66%)
<b>Total</b>	<b>360</b>	<b>294</b>	<b>16 (5.4%)</b>	<b>66</b>	<b>8 (12.1%)</b>	<b>233 9 (3.86%)</b>	<b>127 15 (11.8%)</b>	<b>23 (6.38%)</b>	<b>3 (0.83%)</b>

\*(SYNBIOTIC EUROP SAS) \*RBT: Rosebengal test

\*\*ELISA: Enzyme linked immunosorbent assay

## Discussion

Brucellosis is prevalent in some middle-eastern countries such as Iraq, Iran, Saudi Arabia, Turkey, Egypt, Syria (2) and some south European countries such as Greece, Italy and Spain (9). Iraq borders with several of these countries and is situated within this geography. Therefore, Iraq lies within the risky area between Middle East and Europe. Various prevalence rates of brucellosis have been reported for human and cattle population from different parts of Iraq (12). Prevalence of brucellosis in cattle has been reported from a wide range of countries. In the current study, the Seroprevalence of brucellosis was determined to be 6.36% by RBT and 0.85% by ELISA thus may be, our ELISA kit may be less sensitive than RBT. The results of this study is slightly higher than (12) who were reported 3% in Iraq and lower than other studies like Iran and Emirate, Turkey and East Anatolia were reported 0.85, 1.3, 1 and 6.2%, respectively (13, 14, 15 and 16) But other studies in Jordan, Egypt, Saudi Arabia were reported that (25, 23, 18.7%) respectively (17, 18 and 19) are higher than our results. The reasons for this high prevalence might be explained by the fact that preventive measures are not implemented thoroughly, In addition, the farmers in this district are not well-educated and seem uninterested in the prevention of their animals to these infectious diseases. Furthermore, animal breeding is performed as small-scale family farming, which may also hamper the control of infectious diseases or may be the restricted migration of animals between the Iraq and neighboring countries specially cattle or may be due to climatic condition. According to the prevalent rate associated with age group our study showed that low prevalence rate in young cattle than adult which similar (20) and (21) which they reported higher prevalence of infection in animals more than 4 years of age . It appears that the high prevalence of brucellosis among older cows might be related to maturity with the advancing age. Thereby, the organism may have propagated to remain either as latent infection or it may cause clinical manifestation of the disease (21).

Regarding to the sex infection rate in females was 5.4% but in males is about 12.1%. There are controversial reports regarding the prevalence of brucellosis in relation to sex of animals, as some reported significantly higher prevalence in females than in males (22). But some reports indicate that Brucella antibody titers are not associated with sex (23).

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