

بسم الله الرحمن الرحيم

**Sudan University of Science and Technology**  
**College of Graduate Studies**

**Seroprevalence and Risk factors of Caprine Brucellosis**  
**in El-genaina, West Darfur, Sudan**

تقدير الانتشار وعوامل الخطر لمرض البروسيلا في الماعز في

الجنينة -ولاية غرب دارفور-السودان

By

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*Dedication*

To my father

To my mother

To my brothers

To my husband

with my thanks

## I

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First of all, thanks and praises to Allah, the lord of the mankind and all existing creatures and the prayers and peace are upon the merciful prophet .Mohammed

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## LIST OF ABBREVIATIONS

<b>FAO</b>	<b>Food and Agriculture Organization</b>
<b>WHO</b>	<b>World Health Organization</b>

<b>OIE</b>	<b>Organization for Animal Health</b>	
	<b>RBT</b>	<b>Rose Bengal Test</b>
	<b>RBPT</b>	<b>Rose Bengal Plate Test</b>
<b>Enzyme –Linked Immuonosorobent Assay</b>		<b>ELISA</b>
<b>Indirect- Enzyme –Linked Immuonosorobent Assay</b>		<b>I-ELISA</b>
	<b>CFT</b>	<b>Complement Fixation Test</b>
	<b>SAT</b>	<b>Serum Agglutination Test</b>
	<b>Milk ring test</b>	<b>MRT</b>
	<b>Micro agglutination test</b>	<b>MAT</b>
<b>Modified Rose Bengal Plate</b>		<b>mRBPT</b>
<b>CDC</b>	<b>Center for Disease Control</b>	
<b>PCR</b>	<b>Polymerase chain reaction</b>	
	<b>Prevalence</b>	<b>P</b>
	<b>Chi-square</b>	<b>X</b>
	<b>Relative risk</b>	<b>R.R</b>
	<b>Odd ratio</b>	<b>OR</b>
<b>95%confidence interval</b>		<b>95%CI</b>
	<b>North</b>	<b>N</b>
	<b>East</b>	<b>E</b>



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### Abstract

A cross-sectional study was conducted in west Darfur state Elgenaina to estimate prevalence of caprine brucellosis and identify associated risk factors. This study was done between December 2014 and February 2015. A total of 270 goats were selected using cluster sampling method, and at the same time data such as sex, age and breed were also recorded. The samples were diagnosed using Rose Bengal test (RBT), to detect the *brucella* seropositivity. The risk factor identification was done simultaneously with the blood sampling. The factors assessed included: age, sex, breed, presence of abortion, presence or retained placenta, parity, type of production, sharing male, contact with other animals and herd size.

The overall prevalence was 4.8%. Out of 10 variables screened in the univariate analysis using the Chi-square test, only 5 variables were significant with p-value  $\leq 0.25$ . The variables that had significant association with seropositivity of caprine brucellosis were: age (p-value= 0.029), abortion (p-value= 0.000), parity (p-value= 0.115), type of production (p-value= 0.040) and sharing male (0.046). The prevalence of *brucella* infection according to age of goat was 2.97% in animals less than 2 years and 8.62% in animals from 2 to 4 years and 0% in animals more

than four years, according to six were 5.17% in female and 0% in male , according to breed were 5.98% in local breed and 0% in cross breed . Prevalence of abortion .were 24% in animal aborted and 2.85% in animal not aborted

The results of the univariate analysis by using the Chi-square for the following potential risk factors were: Age. (P-value=.029), Sex (p-value=.309), breed (p-value=.370), abortion (p-value=.000), history of retained placenta (p-value=.303

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Parity (p-value=.115), type of production (p-value=. (P-value=.040), sharing male (p-value=.0.046), contact with other animal (p-value=.610) and herd size (p-value=.754

These factors were considered for further analysis using forward logistic regression analysis, and the final model revealed only one variable with p-value  $\leq 0.05$ . A significantly (p-value=0.000) higher prevalence of brucellosis was recorded in animal .(aborted (24%) than animal not aborted (2.85%

## ملخص الدراسة

أجريت دراسة مقطعية في ولاية غرب دارفور-الجنيحة لتقدير انتشار مرض البروسيلا في الماعز وتحديد عوامل الخطر المرتبطة بها. أجريت هذه الدراسة بين شهر ديسمبر 2014 وفبراير 2015. وقد تم اختيار مجموعة 270 ماعز باستخدام أسلوب المجموعة، وفي الوقت نفسه سجلت البيانات مثل الجنس والعمر والسلالة وتم تشخيص العينات باستخدام لوحة اختبار الربوز بنغال (RBPT) للكشف عن ايجابية البروسيلا. وقد تم تحديد عوامل الخطر التي كانت تدر في وقت واحد مع أخذ عينات الدم وتشمل العوامل المقررة العمر والجنس والسلالة والولادة وجود الإجهاض وجود احتباس المشيمة، و، ونوع الإنتاج، وتقاسم النكور والاتصال مع الحيوانات الأخرى وحجم القطيع.

كان الانتشار الإجمالي 8.4% من أصل 10 عامل خطر تم فحصه في تحليل المتغيرات الأحادية باستخدام اختبار الفرضية الإحصائية ( $\chi^2$ )، لم تظهر النتائج سوي 5 عامل خطر بنسبة دلالة إحصائية  $P \geq 25.0$ .

$\geq$  value المتغيرات التي كان لها ارتباط مهم مع ايجابية داء البروسيلا في الماعز هي: العمر ( $p$ -value = 0.029)، وجود تاريخ الإجهاض ( $P$ -value = 0.000)، الولادات ( $p$ -value = 0.115)، نوع الإنتاج ( $p$ -value = 0.040)، و تشارك النكور كان انتشار عدو البروسيلا وفقاً لسن الماعز 2.97% في الحيوانات أقل من 2 سنة و 8.62% في الحيوانات من 2-4 سنوات. 0% في الحيوانات أكثر من أربع سنوات، وفقاً للجنس كانت 5.17% في الإناث و 0% في النكور، وفقاً للسلالة كانت 5.98% للسلالات المحلية و 0% في السلالات المهجنة، وفقاً لتاريخ الإجهاض 24% في الحيوانات التي أجهضت و 2.85% في الحيوانات التي لم تجهض. كانت نتائج تحليل المتغيرات الأحادية باستخدام اختبار الفرضية الإحصائية  $\chi^2$  لعوامل الخطر كالتالي: العمر ( $P$ -value = 0.029) الجنس ( $p$ -value = 0.309).

السلالة. (p-value= 0.370) تاريخ وجود الإجهاض. (p-value=0.000). ،  
تاريخ وجود احتباس المشيمة. (p-value =0.303) بالولادات. (P-  
value=0.115) نوع الإنتاج (p-value=0.040) تشريك النكور. (P-  
value=0.046) التواجد مع حيوانات أخرى. (p-value =0.610) وحجم  
القطيع. (p-value=0.754).  
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دلالة إحصائية 0.05. (P-value  $\geq$  0.05).