

بسم الله الرحمن الرحيم

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**STUDY ON CONTROLLING BACTERIAL
HAZARD IN RAW MILK**

دراسة للتحكم في الأخطار البكتيرية للبن الخام

By

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DEDICATION

To my

Fathers, brothers, teachers and colleuges

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List of Abbreviation

HACCP	Hazard Analysis & Critical Control Points
FDA	Food and Drug Administration
ICMSF	International Commission of Microbiological Specification for Foods
CCPs	Critical Control Points
CP	Control Point
WHO	World Health Organization
FAO	Food Agriculture Organization
VRBL	Violet Red Bile Lactose
XLD	Xylose Lysine Deoxy Chlorate
TSI	Triple Sugar /Iron
L.E.M.B	Levines Enosin Methylene Blue
L.T	Lauryl Tryptose
B.G.B	Brilliant Green Bile
M.K.T.T	Muller-Kauffman Tetraionate
A.P.C	Aerobic Plate Count
P.C.A	Plat Count Agar
SPSS	.Statistical Package for Social Science
ISO	International Organization for Standardization
SSMO	Sudanese Standards& Metrology Organization
FISIS	Food Safety and Inspection Service
NACMCF	National Advisory Committee on Microbiological Criteria for Food

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ABSTRACT

This study was conducted to investigate the bacterial hazards in milk samples collected randomly from different sources. Forty bovine milk samples were collected from different areas in Khartoum state; nine samples from different farms, nineteen samples were collected from different areas of sales points and 12 samples from different end consumers. Aerobic plate count (A.P.C), Coagulase positive staph count and Coliform group count were investigated. Also the presence of *E-coli* and *Salmonella* was detected. For the (A.P.C), Coagulase positive staph and Coliform group count no significant differences were observed in all milk samples collected from the three sources. The milk samples collected from the three sources showed 17.5% (+ve) and 82.5% (-ve) when detected for *E. coli*. The milk samples collected from farm showed that 11.1 % (+ve) and 88.9% (-ve). Samples collected from sales point showed 21.1% (+ve) and 78.9% (-ve). While the samples collected from the end consumer showed 16.7 % (+ve) and 83.3% (-ve). The milk samples collected from the three sources revealed non significant ($P>0.05$) variation for the presence of *E. coli*. All samples collected from the three sources showed 4.5% *salmonella* and 59.5% (-ve). Farms samples showed 11.1% and 88.9% (-ve). The samples of milk collected from sales point showed 21.1% and 78.9% (-ve) *salmonella*. While the end consumer samples showed 8.3% and 91.7% (-ve) *salmonella* present absent.

On the other hand there were obvious differences in the minimum and the maximum values in the (A.P.C) and Coagulase positive staph. count. That indicates the degree of cleanness in the milking system, water and equipment used. The study recommended highlighting on HACCP system and more workshops are needed, also further efforts is needed for perfect management system especially the transportation and distribution from farm to consumer, The study recommended the decision maker to take action for controlling hazards in row milk especially bacterial hazards.

ملخص البحث

هذه الدراسة صمّمت لتحري الأخطار البكتيرية في اربعون عينة حليب بقرى جمعت من مصادر مختلفة في ولاية الخرطوم، تسع عينات جمعت من مزارع مختلفة، تسع عشرة عينة جمعت من نقاط بيع مختلفة وبينما جمعت اثنا عشر عينة من مستهلكي اللبن النهائي. تم التحقق من العدد الكلي للبكتريا الهوائية والإستافيلوكوكس وتم عد المجموعة القولونية. كذلك تم اختبار وجود الاشريشيا القولونية والسالمونلا. لا توجد اى اختلافات معنويه فى كل الاختبارات التى اجريت على عينات الحليب التى جمعت من المصادر المختلفه وهناك اختلافات واضحة في الحد الأدنى والحد الأقصى للقيم فى كلا من العد الكلي للبكتريا الهوائية والإستافيلوكوكس وقد عزي هذا الاختلاف لاختلاف نظم الإدارة في مصادر اللبن الثلاث. كذلك اظهرت عينات اللبن المجموعه من المصادر الثلاث ١٧,٥% موجبه و ٨٢,٥% سالبه عند اختبار الاشريشيا كولاي، أظهرت العينات المجموعه من المزرعة ١١,١% موجبه و ٨٨,٩% سالبه كما أظهرت العينات المجموعه من نقاط البيع ٢١,١% موجبه و ٧٨,٩% سالبه، بينما اظهرت العينات المجموعه من المستهلك النهائي ١٦,٧% موجبه و ٨٣,٣% سالبه العينات المجموعه من الثلاثه مصادر لم تظهر اختلافا معنويا عند ($p > 0.05$) لاختبار وجود الاشريشيا كولاي. كل العينات المجموعه من الثلاثه مصادر أظهرت ٤,٥% و ٥٩,٥% سالبه لإختبار وجود السالمونيلا. أظهرت عينات المزرعة ١١,١% و ٨٨,٩% سالبه وأظهرت عينات نقاط البيع ٢١,١% و ٧٨,٩% سالبه عند إختبار التحقق من وجود السالمونيلا بها، بينما أظهرت العينات الماخوذة من المستهلك النهائي ٨,٣% و ٩١,٧% سالبه لإختبار السالمونيلا. عزي الاختلاف الواضح في القيم العليا والدنيا لكلاً من العد الكلي للبكتريا الهوائية والإستافيلوكوكس وهذا يُعزى لدرجة النظافة ونظم الحلابة والماء والمعدات المستخدمة. أوصت الدراسة بتسليط الضوء علي نظام الهسب وكذلك المزيد من ورش العمل وكذلك بذل المزيد من الجهد لتحسين نظام الإدارة خاصة النقل والتداول من المزرعة إلي المستهلك النهائي، وكذلك أوصت الدراسة للمختصين وصناع القرار لأخذ تدابير وتفعيل المواصفات وتطبيقها للتحكم في أخطار اللبن الخام خاصة البكتيرية منها.

