

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

إِنَّمَا إِلَهُكُمُ اللّٰهُ الَّذِي لَا إِلَهَ إِلَّا هُوَ وَوَسِعَ  
{كُلَّ شَيْءٍ عِلْمًا}

صدق الله العظيم

( سورة طه الآية :98 )

# Dedication

To those who taught me a word...

To my father...

To my mother...

Brothers...

Sisters...

And all my friends...

With ever lasting love...

# Acknowledgment

**F**irst, I thank Almighty, Allah who granted me the aptitude and patience to conduct and finish this study. I wish to express my sincere thanks and faithful gratitude to the honest, modest supervisor Dr. Daoud Elzubair Ahmed for his generous limitless assistance, encouragement and advice. Moreover; I would like to convey my cordial compliments to Engineer Elsunni Hamid Ibrahim for his enormous advice throughout the study. My compliments sent to Dr. Mohammed Taj Eldin, Dr. Muzzamil Atta and Engineer Murwan the manager of African Tannery for their help and assistance. Also my thanks are extending to ustaz .Amnna Bahar, Tahani, Zawahir, Nahid and Abd Elrahman, - dairy technology lab. Also my thanks are extending to ustaz Hebah, Nandah and Mukhtar in Nutrition laboratory. Finally it is a chance to convey my thanks to every one who helped, advised or contributed in this work.

### **Abstract**

This study was conducted in the Nutrition laboratory, College of science and technology of Animal Production, Sudan University of Science and Technology, during April - June 2009. The aim of

the study is to investigate the effects of enzyme concentration and incubation period on gelatin extraction and the possibility of gelatin extraction from cattle hides by using different concentration of pancreatic alkaline enzyme containing trypsin and pepsin (Rock enzyme 7500-L) for different incubation periods. Pieces of Limed–fleshed cattle hides weighing 5kgs were used in this study. They were cut into small pieces each 5cm<sup>2</sup> delimed, degreased and washed. The samples were treated with different concentration of enzyme (0%, 1%, and 2%) for three different incubation periods (three, six and nine hours). The extraction continued for six hours in Water Bath at 70C°. The yield, color and pH of gelatin were measured. The study showed that the concentration of the enzyme has highly significant effect (\*\*) at (p<0.01) on gelatin yield. The percentages of gelatin yield of the first extraction at 0%, 1% and 2% was found to be 4.33%, 6.75% and 8.6% for three hours , 4.2%, 6.61% and 8.11% for six hours , 4.31%, 7.3% and 9.21 % for nine hours respectively . Higher yields of gelatin extraction were obtained by using 2% of enzyme. In this study the color of gelatin extracted at 0%, 1% and 2% enzyme concentration were very light creamy, light creamy and creamy, while the pH of gelatin extracted at the same concentration were in average 6.98, 6.96 and 6.98 respectively.

## ملخص الأطروحة

أجريت هذه الدراسة في معمل التغذية بكلية علوم وتكنولوجيا الإنتاج الحيواني - جامعة السودان للعلوم والتكنولوجيا في الفترة من أبريل - يونيو 2009.

الهدف من هذه الدراسة هو معرفة تأثير تركيز الإنزيم وفترة التحضين على إستخلاص الجيلاتين من جلود الأبقار وإمكانية إستخلاص الجيلاتين بإستخدام تراكيز مختلفة من إنزيم البنكرياس القلوي الذي يحتوي على إنزيمي الببسين والترسين لفترات حضانة مختلفة.

أستخدمت في هذه الدراسة قطع من جلود الأبقار بعد إزالة الشعر واللحمية وتزن نحو 5 كيلوجرام. تم تقطيع هذه الجلود الى قطع صغيرة مساحتها تقريبا 5 سم مربع , أزيل منها الجير والدهن ونظفت بالماء وبعد ذلك عومت بثلاثة تراكيز من الإنزيم 0% , 1% و 2% ولثلاثة فترات تحضين , ثلاث , ست وتسع ساعات .أستخلص الجيلاتين في حمام مائي في درجة حرارة 70 درجة مئوية ولمدة ست ساعات وتم قياس الناتج واللون والأس الهيدروجيني للجيلاتين المستخلص . أوضحت الدراسة أن تركيز الإنزيم له تأثير معنوي عند مستوى المعنوية (0.01) على ناتج الجيلاتين حيث كانت النسبة المئوية للناتج من الإستخلاص الأمل بإستخدام 0% , 1% و 2% ، 4.33% ، 6.75% و 8.6% و 4.2% ، 6.61% و 8.11% و 4.31% ، 7.3% و 9.21% لثلاث، ست وتسع ساعات على التوالي. كذلك أوضحت الدراسة أنه لا يوجد أي تأثير معنوي على اللون والأس الهيدروجيني حيث كن اللون للجيلاتين الناتج بإستخدام تركيز 0% , 1% و 2% ولثلاث فترات تحضين مختلفة (ثلاث , ست وتسع ساعات) هو شفاف جدا الى شفاف الى كرمي على التوالي. وكن الأس الهيدروجيني للجيلاتين الناتج بإستخدام نفس التراكيز من الإنزيم ونفس فترات التحضين هو 6.98 , 6.96 و 6.98 على التوالي.

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### **Abbreviations**

A.T.P	Adenosine Tri Phosphate.
B.S.E	Bovine Spongiform Encephalopathy.
G.M.E	Gelatin Manufacture of Europe.
M.A.R	Ministry of Animal Resource.
MTGase	Microbial Transglutaminase.
Tgase	Transglutaminase.
N.O.S.B.T.A.P	National Organic Standards Board Technical



U.N.C.T.A.D/GATT  
U.S.F.D.A

Advisory Panel.  
International Trade Center.  
United State Food and Drug Administration.

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