

Sudan University of Science and Technology
College of Graduate Studies and Scientific Research

**Effect of fortifying camel's milk with different levels of skim
milk powder on the physicochemical, microbiological and
sensory characteristics of yoghurt**

تقوية لبن الابل باضافة مستويات مختلفة من لبن البدرة منزوع الدسم واثرها في
الصفات الفيزيوكيميائية والميكروبيولوجية والحسية للزبادي

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال الله تعالى:

﴿أَفَلَا يَنْظُرُونَ إِلَى الْإِبْلِ كَيْفَ خُلِقَتْ﴾

(سورة الغاشية: 17)

DEDICATION

To my father

To the spirit of my mother

Brother and my Sisters

With Love

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First, almost grateful thanks to Allah for all he has giving me to complete this work .I wish to express my special appreciation and gratitude to my supervisor Dr.Omer Ibrahim Ahmed for his helpful Supervision and proper guidance Grateful thanks for his patience, Kindness attitude, advices and encouragement to carry out this work.

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ABSTRACT

The present study was carried out in the milk processing unit at college of animal production, Sudan University of science and technology during month of January 2012. The effect of adding different levels of skim milk powder(0,5,7%) and storage period on the quality of yoghurt was examined in this study. fresh camel milk was purchased from Alaas farm at Khartoum North. Nine litres of raw camels milk were divided into three portions . The first treatment was used as control.To the other two treatments 5 and 7% of skim milk powder was added, then the milk in each treatment was heated in

a water bath at 85°C for 30 min. milk samples were cooled to approximately 43°C, and inoculated with commercial yoghurt culture (2 %) and packed into plastic cups (200g capacity) in triplicates. The plastic containers were incubated at 43°C for 3 hrs then the incubation temperature decreased to 33°C until coagulation occurred (16 hours), thereafter samples from different treatments were stored at 4°C for 0, 5 and 10 days. Yoghurt Samples were taken for chemical, microbiological and sensory analysis.

The results indicated that yoghurt treated with 7% skim milk powder had the highest viscosity value ($p \leq 0.01$) during storage period. The results showed that the control yoghurt had the highest pH value ($p \leq 0.01$) during storage period when compared with other treatments. Statistical analysis pointed out that there were no significant differences in chemical composition of the yoghurt from different treatments during storage.

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The results demonstrated that yoghurt treated with 7% skim milk powder was significantly higher ($p \leq 0.05$) in total bacterial count (7.70×10^6 cfu/ml) than the control yoghurt (5.29×10^6) cfu/ml. No significant differences were observed in lactic acid bacterial count. Coliforms and E.coli bacteria were not detected in tested samples

The results indicated that yoghurt treated with 7% skim milk powder had the highest ($p \leq 0.01$) flavour. Also there was significant difference ($p \leq 0.05$) in overall acceptability in tested treatments. Yoghurt made with 7% skim milk powder had the highest scores.

الخلاصة

تم اجراء هذه التجربة في شهر يناير 2012 م في وحدة تصنيع الالبان بكلية الانتاج الحيواني جامعة السودان للعلوم والتكنولوجيا ، اجريت هذه الدراسة بغرض دراسة تأثير اضافة نسب مختلفة من الحليب المجفف منزوع الدسم للبن الإبل على جودة الزبادى المصنع منه خلال فترة التخزين.

تم الحصول علي حليب الابل الخام من مزرعة العاص شمال مدينة الخرطوم بحري. تسعة لترات من حليب الابل الخام قسمت الي ثلاث اقسام متساوية . تم إجراء ثلاثة معاملات الاولى هي الشاهد حيث صنع لبن الإبل بعد بسترتة الى زبادى تم إضافة 5 و 7 % لبن بودرة منزوع الدسم فى كل من المعاملة الثانية والثالثة على التوالي. بعد بسترة اللبن فى كل من المعاملات المذكورة تم تبريد اللبن الى 43 درجة مئوية ثم اضيف بادي الزبادى بنسبة 2% من كمية اللبن المستخدم ثم عبئى

اللبن الملقح فى عبوات بلاستيكية وتركت فى الحضان فى درجة 43 درجة مئوية لمدة 3 ساعات ثم خفضت درجة حرارة الحضان الى 33 درجة مئوية وترك حتى اكتمال عملية التجبن (16 ساعة). بعده خزنت العينات 3 مكرر لكل معاملة فى الثلجة لمدة 10 ايام ثم اجري التحليل الكيمياءى والتقييم الحسى للعينات فى اليوم الاول والخامس والعاشر. أجرى التحليل الإحصائى للبيانات بإستخدام برنامج SPSS .

ابانت نتائج التحليل الكيمياءى للحليب الخام قبل التصنيع الاتي : البروتين 2.8 % ، المواد الصلبة الكلية 10.3 %، نسبة الدهون 4.4 % ، درجة pH 6.5 ، ونسبة الرماد 0.82 % ، سكرالاكتوز 4.3 % . وهذه النسبة مناسبة لمواصفة تصنيع الزبادي .

اوضحت نتائج التحليل ان الزبادي المصنع بنسبة اضافة 7% كانت له اعلي نسبة من اللزوجة (p≤0.01) خلال فترة التخزين . وكذلك اوضحت النتائج ان الزبادي المصنع بنسبة اضافة 0 % (كنترول) كانت له اعلي نسبة من حيث الاس الهيدروجيني (p≤0.01) خلال فترة التخزين .

اما بالنسبة للمحتوي الميكروبي كانت هناك فروق معنوية ظاهرة خلال فترة التخزين حيث اوضحت النتائج ان الزبادي ذو نسبة الاضافة 7% كان الاعلي من حيث المحتوى الميكروبي (p≤0.05) للعدد الكلي للباكتيريا (7.70×10^6) بينما يليه الزبادي ذو نسبة الاضافة 0% (الكنترول) (5.29×10^6). بينما جاءت النتيجة سلبية بالنسبة للباكتيريا القولونية والاشيرشياكولاي .

اما بالنسبة للتقييم الحسى فقد اكدت النتائج ان الزبادي المصنع بنسبة اضافة 7% كانت له اعلي درجة من حيث النكهة (p≤0.01) يليه الزبادي المصنع بنسبة اضافة 5% وذلك فى اليوم العاشر من فترة التخزين . وكذلك كان الاعلي درجة (p≤0.05) فى القبول العام يليه الزبادي المصنع بنسب اضافة 5% اليوم العاشر فى نهاية فترة التخزين .