

الآية

بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ

قال تعالي :-

وَإِن لَّكُمْ فِي
الْأَنْعَامِ لَعِبْرَةٌ
نُفِيقِكُمْ مِّمَّا فِي
بُطُونِهِ مِنْ بَيْنِ
فَرْثٍ وَدَمٍ لَبَّأً
خَالِصًا سَائِغًا
لِلشَّارِبِينَ (66)
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صدق الله العظيم

Dedication

To the soul of my father ...

And my mother

To my family ...

Friends and all colleagues...

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List of Abbreviation

DM	Dry matter.
CP	Crude protein.
GNC	Groundnut cake.
CSC	Cottonseed cake.
SFC	Sunflower cake.
DNA	Deoxyribonucleic acid.
NPN	Non protein nitrogen.
VFA	Volatile fatty acids.
SCP	Soluble crude protein.
RUP	Ruminal undegradable protein.
RMP	Ruminal microbial protein.
MP	Metabolizable protein.
AA	Amino acids.
NCBI	National center of biotechnology information.
ACT	Africa city of technology.
MW	Molecular weight.
FC	Fit curve.
SUST	Sudan university for science and technology.
SPSS	Statistical paggage for social science.

Abstract

The present experiment was carried out to determine the rumen dry matter (DM), crude protein (CP) degradability and outflow rate (K) of three oilseed cakes which are groundnut cake GNC (*Arachis hypogea*), cottonseed cake CSC (*Gossypium barbadense*), and sunflower cake SFC(*Heliuthus annuus*), Three rumen fistulated Kenana bulls at age 3 – 3.5 years approximately weighing 200 Kg , were used in the present experiment. The nylon bag technique was used to determine effective degradability in the rumen. The bags were incubated in the rumen of each animal for 6- 12- 24- 36 and 48 hrs. Bioinformatics technique software was used to analyze (DNA) deoxyribonucleic acid through (ProtParam program) and to determine the physiochemical properties and amino acids concentration of three oilseed cakes protein.

The result showed that there were significant difference among all the three oilseed cakes for dry matter and crude protein effective degradability. GNC recorded the highest effective degradability of dry matter and crude protein in the rumen of the three cakes for the above parameter, with significance level of ($p < 0.05$) in most incubation periods. The degraded values were (88.6) and (92.2) for dry matter crude and crude protein respectively, at out flow rate $k = 0.02$, at 48 hours

incubation time. Cottonseed cake had medium degraded values of dry matter and crude protein effective degradability (76.6) and (86.5) respectively, at 48 hours incubation time, and out flow rate $K=0.02$. With significance difference ($p>0.05$). Sunflower cake had the lowest effective degradability of (74.6) and (78.5) for dry matter and crude protein effective degradability respectively, at out flow rate $K=0.02$, with significance difference ($p>0.05$), at 48 hours incubation time. The result of this study was compared favorably well with other similar degradability studies.

Bio informatics analysis used (ProtParam program) to determine molecular weight and amino acids concentration of protein. It revealed that GNC had (2384.6 and 207) for molecular weight and amino acid concentration respectively. Cottonseed recorded (17306.5 and 149) for molecular weight and amino acid concentration respectively. While the sunflower cakes recorded (16135.5 and 141) for molecular weight and amino acids concentration respectively. The result obtained from bioinformatics (ProtParam program) justified the above results recorded from degradability study which showed that the Groundnut cake has unstable protein. Cottonseed and Sunflower cake were stable protein according to molecular weight and amino acids concentration. Moreover ProtParam program recorded the instability index and half life of protein synthesis.

ملخص البحث

أجريت هذه الدراسة لتحديد نسبة تكسر المادة الجافة (DM) والبروتين الخام (CP) في الكرش ومعدل التدفق لكل من أمبار بذرة الفول السوداني (*Arachis hypogea*) وأمبار بذرة القطن (*Gossypium barbadense*) وأمبار زهرة دوار الشمس (*Heliuthus annuus*). استخدمت في هذه التجربة فتحة الكرش الجراحية لثلاثة عجول كنانية في أعمارها ما بين 3 إلى 3.5 سنة، وتزن حوالى 200 كجم تقريباً. استخدمت تقانة أكياس النايلون في هذه الدراسة لتحديد معدلات التكسر في الكرش للمادة الجافة والبروتين الخام، وتركب الأكياس في الكرش لكل حيوان في الأزمان: 6، 12، 24، 36 و 48 ساعة. استخدم برنامج Software ProtParam Programme في تقانة المعلومات الحيوية Bioinformatics لتحليل الحمض النووي الرايبوزي منزوع الأكسجين (Deoxyribonucleic acid) DNA لمعرفة تركيب الأحماض الأمينية والأوزان الجزيئية وتحديد الخصائص الفيزيائية والكيميائية للبروتين. أظهرت الدراسة إلى وجود فروق معنوية بين الإمبارات الثلاث في معدل تكسر المادة الجافة والبروتين الخام في الكرش. ومن خلال النتائج، سجل أمبار الفول السوداني أعلى معدل تكسر في الكرش للمادة الجافة والبروتين الخام (88.6 و 92.9) على التوالي، بمعدل تدفق ك = 0.02 وعند مستوى معنوية

أما . أمبار بذرة الشمس سجل أقل معدل تكسر وإختفاء للمادة الجافة والبروتين الخام(,74.6,86.5) على التوالي بمعدل تدفق . > .. من نتائج التحليل الإحصائي لا توجد فروق معنوية بين الأمبارات الثلاث في معظم الساعات الأولى للتحصين, لكن سجل أمبار الفول السوداني فروق معنوية بينه وبين أمبار بذرة القطن و أمبار بذرة الشمس بالنسبة للمادة الجافة والبروتين الخام في فترات التحصين , 36,24,12 و 48 ساعة , بينما لا توجد فروق معنوية بين أمبار بذرة القطن و أمبار بذرة الشمس , بالنسبة للمادة الجافة والبروتين الخام في كل فترات التحصين

من خلال النتائج لبرنامج Software ProtParam Programme سجل أمبار الفول السوداني أعلى وزن جزيئ 2384,6 وتركيز للأحماض الأمينية فيه 207 بينما الوزن الجزيئ لأمبار بذرة القطن 17306,5 وتركيز الاحماض الأمينية فيه 159 بينما أظهر أمبار بذرة الشمس أقل وزن جزيئ 161350,5 وتركيز الأحماض الأمينية فيه 141 .

من خلال النتائج أظهرت الدراسة أن أمبار الفول السوداني ذي بروتين غير مستقر بينما أمبار بذرة القطن و أمبار بذرة الشمس يمتلكان بروتين ذي طبيعة مستقرة تبعاً للأوزان الجزيئية وتركيز الأحماض الأمينية .

