



## The Effect of Using Nucleus Dates Marketer as Energy Source in Nubian Goat Rations on Production, Milk Quality and Animal Weight

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### Abstract

This experiment was carried out at the Sudan University of Science and Technology Goat Improvement Unit for 50 days to know the effect of using dates kernel powder as energy source in Nubian goat diets on weight, quantity and quality of milk produced. (9) Nubian goats was used, evenly divided into three groups, control group (A) and experimental group (B) and experiment group (C). The animals were fed on three diets, the first containing the control diet (A) (molasses 10%), the second diet (B) containing (molasses 5%, the nucleus of 10 dates), and the third diet containing (C) ( Kernel of dates (20%) was added to Abu Sabeen as feed. Productivity measurements of animal weight, feed intake and milk yield were taken. Milk samples were taken weekly and chemically analyzed. The data were statistically analyzed using ANAVA - TEST and the data were sorted using TUKEY. The results of statistical analysis of milk production showed significant differences at ( $P < 0.01$ ) where the experimental group (C) recorded the highest average milk production compared to the experimental group (B) and the control group (A). Significant differences in ( $p < 0.05$ ) were found only in acidity, where there was significant difference at ( $p < 0.01$ ). As for the amount of feed consumed, the results of the statistical analysis showed no significant differences at ( $P > 0.05$ ). (C) recorded the highest average feed consumption compared to experiment group (B) and control group (A). As for the weight of the acquired animal, the results of the statistical analysis showed that there were significant differences at the level of ( $P < 0.01$ ) where the experimental group (C) recorded the highest average weight gained compared to the experimental group (B) and the control group (A).

**Keywords:** Nuclei of dates - Nubian goat - Milk productivity - The quality of yogurt.

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### Introduction

Nutrition is one of the most important factors affecting the productivity of ruminants. Proper and adequate nutrition should be available in quantity and quality. Ruminant

feeding has witnessed great developments to improve efficiency and reduce costs in the past three decades.

In addition to nutrition, the growth and development of the animal depends on its

genetic characteristics and environmental factors that have a significant impact on animal production. Without nutrition, metabolism does not occur in the animal body to obtain the energy necessary for his life and perform vital body functions and the formation of the skeleton, meat, fat, skin, hair and milk. If the food is low in quantity or incomplete in its nutrients, the weight of the animal decreases and the muscles become weakly formed and the bones become disrupted, resulting in the formation of a skeletal structure with abnormalities such as incomplete rib cage as well as low animal productivity and deterioration of health. (Eltayeb, 1992).

The breeder feeds goats to increase their production or improve the quality of their milk, hair or meat products.

Modern goat nutrition relies on knowledge of the amount of food eaten, weight and nutrient content in order to establish a suitable feeding program for goats.

Each jam has its own nutritional program based on its experience in breeding and care and often calculates the amount of dry matter provided than the basis of a minimum of 2% and about 6% as a maximum, and depends on the accuracy of nutrition monitoring to determine the feeding times and length of time the animal in the food and desired food quality. It is not desirable to observe the degree of fullness of the rumen and the status of rumination and change in body weight or the amount of milk produced.

(Takala, 1991).

### **Objectives**

Determine the extent of introduction of date nuclei in Nubian goat nutrition as well as determine the percentage of replacement of date nuclei as a source of energy and know and determine the nutritional value of the diet when using date nuclei

### **Materials And Methods**

This experiment was conducted at Sudan University of Science and Technology (Goat Improvement Unit) in the period from 25/09/2018 to 13/11/2018 for 50 days.

#### **Experimental animals:**

Nine individuals of Nubian goats were used, and then divided evenly by their age.

- The first group (control group A) consists of three goats, where fed on the regular diet.

- The second group (experiment group B) consists of three goats, containing 10% of the dates of the dates.

- The third group (experiment group C) consists of three goats, containing 20% of the dates of the dates.

- these goats were placed in the open pens and given adequate care.

#### **Experiment diets:**

First: - Control diet (A): -

It contains (35% peanut gain, 40% wheat bran, 14% salt corn 1%, molass 10%) with protein (15% CP) and energy (12.39 MJ).

Second: - Experiment diet (B): -

Contains (30% peanut gain, 40% wheat bran, 14% salt corn 1%, molasses 5% date kernel 10%) with protein (16.7CP) and energy (11.3 MJ).

Third: - Experiment diet (C): -

Contains (25% peanut gain, 40% wheat rose, 14% fat corn, 1% salt, 20% nucleus) with protein (18.9 CP) and energy (11.7 MJ).

- In addition to these diets, Abu Sbaeen was provided as a filler with the necessary water provided daily and continuously.

- Barns were also cleaned periodically every 10 days.

#### **Tools used: -**

- Standard flask for measuring milk.

- Plastic refinery.

- Bucket for milk.

- A pound to weigh milk.

- Digital balance to measure the amount of rations provided to the animal.

- Hey. Digital balance to weigh animal

**Productivity Measurements**

- The amount of milk produced per day was weighed for each group where animals are milked daily.

- The feed consumed is calculated daily to know the rate of food conversion per group.

- Milk components were analyzed weekly to see the change in chemical composition of the ingredients.

**Statistical Analysis**

After data collection, they were statistically analyzed using ANAVA –TEST and the data were sorted using TUKEY. (Gomez, A. A. (1984). )

**Results and Discussion**

**Weekly Milk Production**

Table (1) shows the average of milk production during the experiment period for the three groups:

Experiment Group (C) (ml)	Experiment Group (B) (ml)	Control Group (A) (ml)	Production yogurt/ml
			Weeks
1315.71	965.71	117.14	First week
1662.85	1294.28	1231.43	Second week
1872.85	1418.57	1282.85	Third week
1547.85	1318.57	1307.14	Fourth week
1625.71	1427.85	1311.43	Fifth week
1658.57	1467.14	1352.85	Sixth week
1705	1352.5	1367.5	Seventh week
1626.99 <sup>a</sup>	1320.66 <sup>b</sup>	1281.46 <sup>b</sup>	Average
**	**	**	Significance

(\*\*)Means that there is a significant difference at the level of (P<0.01) , (a) Means the highest value , (b) Mean value .

The results showed that there were significant differences between the control diet (A) and the diet of experiment (B) and the diet of experiment (C) at the level of significance (p <0.01). Table (5) where the experiment group (C) recorded the highest average milk production during all weeks and the results are as follows:

- In the first week, experiment group (C) recorded the highest average milk production (1315,715 g / week) compared to control group (A) which recorded (1117,143 g / week), followed by experiment group (B) which recorded the lowest average milk production . The percentage of increase in milk production for the third treatment

compared to the first is (17.7%) while the percentage of increase in milk production for the third treatment compared to the second treatment is (36.2%).

- In The second week of experimental group (C) recorded the highest average milk production (1662,857 g / week) compared to the experiment group (B)which recorded (1294,286 g / week) followed by the control group recorded the lowest average milk production (1231,429 g / week). The percentage of increase in the third treatment compared to the second treatment is (28.4%), while the increase in milk production for the third treatment compared to the first is (35%).

- In The third week of experiment group (C) recorded the highest average milk production, where it recorded (1872,857 g / week) compared to the experiment group (B) recorded (1418,571 g / week), followed by control group (A), which recorded the lowest average milk production (1282,857) The percentage of increase in milk production for the third treatment compared to the second treatment is (32%) while the percentage of increase in milk production for the third treatment compared to the first treatment is (45.9%).

- In The fourth week of experimental group (C) recorded the highest average of milk production, where it recorded (1547,857 g / week) compared to the experiment group (B) recorded (1318,571 g / week) followed by control group (A) which recorded the lowest average of milk production (1307,143). The percentage of increase in milk production for the third treatment compared to the second treatment is (17.3%), while the increase in milk production for the third treatment compared to the first treatment is (18.4%).

- In The fifth week recorded the experimental group (C) recorded the highest average milk production, where (1625.714% g / week) compared to the experiment group (B) recorded (1427,857 g / week), followed by control group (A) recorded the lowest average The increase in milk production for the third treatment compared to the second was (13.4%), while the increase in milk

production for the third treatment compared to the first treatment was (23.9%).

- In The sixth week of experiment group (C) recorded the highest average of milk production, where it recorded (1658.57 g / week) compared to the experiment group (B) recorded (146.143 g / week), followed by control group (A), which recorded the lowest average milk production (1352.858) The increase in milk production for the third treatment compared to the second treatment was (13%), while the increase in milk production for the third treatment compared to the first treatment was (22%).

- In The seventh week experiment group (C) recorded the highest average milk production, where it recorded (1705 g / week) compared to the control group (A) recorded (1367.5 g / week), followed by experiment group (B), which recorded the lowest average milk production (1352.5 gm.) The percentage of increase in milk production for the third treatment compared to the first treatment was (26%) while the percentage of increase in the third treatment compared to the second treatment is (24.6%).

This is consistent with Afaf M et al. (2001) in a study entitled the effect of containment of the highest on the nuclei and olive dregs on the production and composition of frankincense goats and sheep were taken quantities of milk with measurement of daily coffee production.

## Weekly Milk Ingredients

Table (2) shows the mean chemical analysis of milk components during the experimental period for the three groups:

Significance	Experiment Group (C) (%)	Experiment Group (B) (%)	Control Group (A) (%)	Yogurt ingredients
NS	3.41a	3.31a	3.11a	Fat
NS	3.46a	3.28a	3.14a	Protein
*	0.20a	0.19ab	0.19b	Acidity
NS	3.9a	3.7a	3.5a	Lactose
NS	0.83a	0.81a	0.77a	Ash
NS	11.59a	11.29a	10.82a	Solids

(NS) Means that there is no significant difference at the level ( $P>0.05$ ), (a) Means the highest value, (b) Mean value, (ab) Means a common value.

The results showed that there were no significant differences between milk components at ( $p<0.05$ ) level except in acidity where there were significant differences at ( $p>0.05$ ).

- The experimental group C had the highest average fat (3.41) compared to the experimental group (B) which recorded (3.31) followed by the control group (A) which recorded the lowest average (3.11). The increase in the third treatment compared to the second was (3%). The percentage of increase for the third transaction compared to the first is (9.6%).

- Protein was the highest in the experimental group (C), which recorded (3.46) compared to the experiment group (B), which recorded (3.28), followed by the control group (A), which recorded the lowest average (3.14) and the percentage of increase for the third treatment compared to the second is The percentage of increase for the third transaction compared to the first is (10%).

- Acidity was the highest mean for the experimental group (C) where it recorded (0.20) compared to the experiment group (B)

recorded (0.19) followed by control group (A) recorded the lowest average (0.19), and the percentage of increase for the third treatment compared to the second is The percentage of increase for the third transaction compared to the first is (17.2%).

- Lactose had the highest mean for the experimental group (C) where it recorded (3.8) compared to the experiment group (B) recorded (3.6) followed by control group (A) which recorded the lowest average (3.5) and the percentage of increase for the third treatment compared to the second is (The rate of increase for the third transaction compared to the first is (8.5%).

As for ash, the highest mean was for the experimental group (C) where it recorded (0.82) compared to the experiment group (B) which recorded the lowest average (0.77), the rate of increase for the third treatment compared to the second is (2.5%) The increase rate for the third treatment compared to the first is (6.4%).

- Total solids had the highest average of experimental group C (11.59) compared to experiment group (B) which recorded

(11.29%) followed by control group (A) which recorded the lowest average (10.82%). The second is (4.1%) while the percentage increase for the third transaction compared to the first is (6.3%).

This is consistent with Afaf M et al ( 2001) in the study of the use of nuclei and olive dregs in sheep and goats where the weight and composition of milk in sheep was higher than in goats and was significant while milk production was less in sheep

**Amount of weekly-consumed feed**

**Table (3) shows the average amount of feed consumed during the experiment period for the three groups:**

Experiment Group (C) (kgs)	Experiment Group (B) (kgs)	Control Group (A) (kgs)	Quantity / kgs Weeks
1416	1230	1188.57	First week
4106.43	3912	4230	Second week
4174.28	4084.43	3968.57	Third week
4417.14	4051.43	43447.14	Fourth week
4352.85	3626.43	4411.43	Fifth week
4500	3700	4500	Sixth week
4500	3464.4	4500	Seventh week
3809.5a	3464.4a	3877.9a	Average
NS	NS	NS	Significance

(NS) Means that there is no significant difference at the level of moral ( $P>0.05$ ) , (a) Means the highest value.

The results showed that there were no significant differences for feed consumed level ( $p> 0.05$ ). The experimental group (C) recorded the highest average feed consumption during all weeks.

- In the first week experiment group (C) recorded the highest average feed consumption (1416 kg / week) compared to the experiment group (B) recorded (1230 kg / week), followed by control group (A) recorded the lowest average feed consumption (1188.5). The feed consumption for the third treatment compared to the second treatment was (15%) and the feed consumption for the third treatment compared to the first treatment was (19%).

- In the second week, the control group (A) recorded the highest average feed consumption (4230 kg / week) compared to the experiment group (C) which recorded (4174.286 kg / week), followed by the experiment group (B) which recorded the lowest average feed consumption where it was recorded (The average feed consumption for the first treatment compared to the third treatment was (3%) and the feed consumption for the first treatment compared to the second treatment (8%).

- In the third week, the experimental group (C) recorded the highest average feed consumption (4174.286 kg / week) compared to the experimental group (B) where it recorded (4084.429 kg / week) followed by

the control group (A) which recorded the lowest average feed consumption (3968.571). The average feed consumption for the third treatment compared to the second treatment was (2%) and the average feed consumption for the third treatment compared to the first treatment was (5%).

- In the fourth week, the control group (C) recorded the highest average feed consumption (4417,143 kg / week) compared to the control group (A) which recorded (4347,143 kg / week), followed by the experiment group (B) which recorded the lowest average feed consumption (4051,429).

The average feed consumption for the third treatment compared to the first was (1.6%) and the average feed consumption for the third treatment compared to the second treatment (9%).

- In the fifth week, the control group (A) recorded the highest average feed consumption (4411.429 kg / week) compared to the experiment group (C) which recorded (4352,857 kg / week), followed by the experiment group (B) which recorded the lowest average feed consumption (3626,429).

### Weekly Animal Weight

Table (4) shows the weight gain of the animal gained during the experiment period for the three groups:

Experiment Group (C) (kgs)	Experiment Group (B) (kgs)	Control Group (A) (kgs)	Weight /kgs Weeks
32.8	30.00	33.00	<b>Primary weight</b>
34.6	30.1	27.3	<b>First week</b>
34.6	30.1	27.00	<b>Second week</b>
35.3	31.5	27.93	<b>Third week</b>
34.5	31.6	26.4	<b>Fourth week</b>
34.2	32.6	27.96	<b>Fifth week</b>
34.8	32.3	27.93	<b>Sixth week</b>
35.1	32.9	29.1	<b>Seventh week</b>
33.39a	31.42ab	28.35b	<b>Average</b>
**	**	**	<b>Significance</b>

(\*\*)Means that there is a significant difference at the level of moral ( $P < 0.01$ ) , (a) Means the highest value , (b) Mean value ,(ab) Means a common value. The results of the statistical analysis showed that

The average feed consumption for the first treatment compared to the third treatment was (1.3%) and the average feed consumption for the first treatment compared to the second treatment (21.6%).

- In the sixth week, the control group (A) and the experiment group (C) recorded the highest average feed consumption where the same quantity consumed (4500 kg / week) followed by the experiment group (B) which recorded the lowest average feed consumption (3700 kg / week). The feed consumption for the first treatment compared to the second treatment is (0%) while the feed consumption for the first treatment compared to the second treatment is (21%).

In the seventh week, the control group (A) and experiment group (C) recorded the highest average feed consumption, where the same amount was consumed (4500 kg / week), followed by the experiment group (B), which recorded the lowest average feed consumption (3650 kg / week). The feed consumption for the first treatment compared to the third treatment was (0%) while the feed consumption for the first treatment compared to the second treatment is (23%).

there were significant differences at the level of significance ( $p < 0.01$ ) where the experimental group (C) recorded the highest average weight during all weeks. Table (7) the results were as follows:

- In the first week, the experimental group (C) recorded the highest average weight gain (34.66667 kg / week) compared to the experimental group (B) which recorded (30.16667 kg / week) followed by the control group (A) which recorded the lowest average weight where it was recorded. The weight gain ratio for the third treatment compared to the second was (14.9%), while the weight gain for the third treatment compared to the first treatment was (26.8%).

- In the second week, the experimental group (C) recorded the same weight as the first week, ie, there was no increase in weight as it recorded (34.66667 kg / week). The control group (A) recorded the lowest average (27 kg / week) where it decreased from the first week where it was (27.33333 kg / week), and the percentage of weight gain for the third treatment compared to the second treatment is (14%). The percentage of increase for the third transaction compared to the first transaction is (28.3%).

- In the third week, the experimental group (C) recorded the highest average weight gain (35.33333 kg / week) compared to the experimental group (B) which recorded (31.5 kg / week), followed by the control group (A), which recorded the lowest average weight gain as recorded (27.93333 kg / week) but higher than the proportion of the second week where it was (27.kg / week), and the percentage of increase in weight for the third treatment compared to the second treatment is (12.1%) while the percentage of increase for the third treatment compared to the first treatment is (26.4%) .

- In the fourth week, the experimental group (C) recorded the highest average weight (34.5 kg / week) compared to the experimental group (B) which recorded (31.6 kg / week), followed by the control group (A) which recorded the lowest average increase (26.46667). Kg / week (decreased from the third week (27.93333 kg/week).

The percentage increase in weight for the third treatment compared to the second treatment is (9%) while the percentage of weight gain for the third treatment compared to the first treatment is (30.3%).

- In the fifth week, the experimental group (C) recorded the highest average weight gain (4.2 g / week) compared to the experimental group (B) which recorded (32.63333 kg / week), but the group (C) decreased weight compared to the fourth week (34.5). The control group (A) recorded the lowest average weight (27.96667 kg / week) but higher than the fourth week (26.46667 kg / week). The percentage increase in weight for the third treatment compared to the first treatment is (22.2%).

- In the sixth week, the experimental group (C) recorded the highest average weight gain (34.83333 kg / week) compared to the experimental group (B) which recorded (32.33333 kg / week), followed by the control group (A), which recorded the lowest average weight gain as recorded (27.93333 kg / week) where it is less than the average weight gain for the fifth week where it was (27.96667 kg / week), and the percentage of increase in weight for the third treatment compared to the second treatment is (7%) while the percentage of weight gain for the third treatment compared to the first treatment It is (56.9%).

- The seventh week of the experimental group (C) recorded the highest average weight gain to increase the weight where it



recorded (35.1 kg / week) compared to the experiment group (B) recorded (32.96667 kg / week) followed by the control group (A) recorded the lowest average weight gain (29.1666 kg / week) The increase in the average weight in the seventh week was higher than the average increase in the sixth week (27.93333 kg / week), and the percentage increase in weight for the third treatment compared to the second treatment is (6%) The weight of the third treatment compared to the first is (20%).

This is consistent with al-Qasim et al. (1993), where it is reported that feeding the Awassi lambs at different levels of the nucleus (the nucleus and pulp of the fruit) led to a faster increase in live weight than that of the lambs that were not fed on the comparison diet (date-free) It also agrees with Elgasem et al (1986) in a study conducted with a view to the nutritional benefit of date plant waste (kernel pulp) as animal feed. The results showed that animals fed on date waste are gaining weight faster than those that did not feed on the kernel. It is also consistent with the Hmedan et al (1993) in the digestion experiment using local rams of the Najdi strain where the results showed that the appropriate proportion to add the nuclei to fatten sheep is (33).

### Conclusion

The study showed that there were significant differences between the control diet (A), the diet of experiment (B) and the diet of experiment (C).

The study also showed that there were no significant differences in the amount of feed consumed, where the experimental group (C) recorded the highest average consumption of feed, while for weight, the study showed no significant differences in the weight gained. Milk The study showed that there were no significant differences except in acidity where there is a significant difference.

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## اثر استخدام مسحوق نواة البلح كمصدر للطاقة في علائق الماعز النوبي على انتاج ونوعية اللبن والوزن المكتسب للحيوان

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### المستخلص

أجريت هذه التجربة بجامعة السودان للعلوم والتكنولوجيا وحدة تحسين الماعز لمدة 50 يوم لمعرفة أثر استخدام مسحوق نواة البلح كمصدر للطاقة في علائق الماعز النوبي على الوزن وكمية ونوعية اللبن المنتج. حيث تم استخدام عدد (9) ماعز نوبي، تم تقسيمها بالتساوي الى ثلاثة مجموعات، مجموعة التحكم (A) ومجموعة التجربة (B) ومجموعة التجربة (C). وتم تغذية الحيوانات على ثلاثة علائق، الأولى عليقة التحكم (A) المحتوية على (مولاس 10%)، والثانية عليقة التجربة (B) وهي تحتوي على (مولاس 5%، نواة 10% بلح)، والثالثة عليقة التجربة (C) وهي تحتوي على (نواة بلح 20%) وتم اعطاءها أبو سبعين كعلف مالى. وتم اخذ القياسات الإنتاجية لوزن الحيوان وكمية العلف المستهلك وكمية اللبن المنتج وتم اخذ عينات من اللبن أسبوعيا وتم تحليلها كيميائيا، وتم تحليل البيانات احصائيا باستخدام ANOVA - TEST وتم فرز البيانات باستخدام TUKEY. وظهرت نتائج التحليل الإحصائي لإنتاج اللبن وجود فروقات معنوية عند مستوى ( $P < 0.01$ ) حيث سجلت مجموعة التجربة (C) اعلى متوسط لإنتاج اللبن مقارنة بمجموعة التجربة (B) ومجموعة التحكم (A). اما بالنسبة لمكونات اللبن اثبتت نتيجة التحليل الاحصائي انه لا توجد فروقات معنوية عند مستوى معنوية ( $P > 0.05$ ) الا في الحموضة حيث يوجد بها فرق معنوي عند مستوى معنوية ( $P < 0.01$ ). أما بالنسبة لكمية العلف المستهلك أظهرت نتائج التحليل الإحصائي عدم وجود فروقات معنوية عند مستوى ( $P > 0.05$ ) لكن مجموعة التجربة (C) سجلت اعلى متوسط لاستهلاك العلف مقارنة بمجموعة التجربة (B) ومجموعة التحكم (A). اما بالنسبة لوزن الحيوان المكتسب أظهرت نتائج التحليل الإحصائي انه توجد فروقات معنوية عند مستوى ( $P < 0.01$ ) حيث سجلت مجموعة التجربة (C) أعلى متوسط للوزن المكتسب مقارنة بمجموعة التجربة (B) ومجموعة التحكم (A).