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Effect of the incorporation of date pits in a diet composed of wheat straw and concentrate on daily gain weight of local sheep (Ouled Djellal)

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ABSTRACT

The aim of this study is to determinate the effect of incorporation of date pits on diets composed of wheat straw and concentrate on the daily gain weight of yearlings lambs. Twelve (12) yearling males of Ouled Djellal breeds, 12 months age, were randomly distributed in tow groups; each one was composed of six animals. The 1st group (G1) received a diet composed of wheat straw and concentrates (60:40) whereas the 2nd group (G2) received a diet formed of a mixture of wheat straw and date pits (80:20) as forage in addition to concentrate constituting 40% of the diet. The diet based on straw +concentrates covered maintenance needs of sheep in addition to total daily gain weight equal to 62.7±0.02 g/day. The animals which have ingested date pits showed an increase of the weight each week with a total daily gain weight of 133.6±0.02 g/day. Date pits had a very significant effect on the daily gain weight of lambs (P<0.001). From these results, we can deduce that the distribution of date pits to sheep would not only ensure animals maintaining needs during the low seasons (winter-summer) but also can increase weight of animals.

Key words: Concentrate, date pits, sheep, straw, weight.

INTRODUCTION

Sheep feeding in Algeria is based on cereal culture products with a production of more than 40millions tones per year [1].

Other local products as by-products of the agro industry (olive cakes, citrus pulp, pits and wasted date) could be an alternative to ensure animal's requirements in the dry season. Date has always been, since the immemorial times, an important element of feeding for humans and animal in all parts of the South and East Mediterranean Sea [2]. In 2006, Algeria ranked in the top 10 of the date producers worldwide [3]. Harry (1936)[4] reported that date pits have been used for cattle feeding. Furthermore, Alwash and De Peters [5], 1982; Gohl, 1981[6] reported that ground date pits can be apart of ruminant ration if a good protein supplement is provided [7]. The use of date residues may constitute a good alternative to other cereal products as they contain carbohydrates and minerals. In addition they present a high digestibility coefficient except for proteins. The aim of this study is to compare the effect of the incorporation of date pits in a ration based on forage (wheat straw) and concentrate at a ratio of 60 to 40 straw: concentrate.

MATERIALS AND METHODS

Three feeds (wheat straw, date pits and concentrate) were used to formulate two diets at a ratio, roughage to concentrate of: 60:40 with either wheat straw or 80:20 a mixture of wheat straw and date pits as forage, and were designated as G1, and G2. The concentrate is composed from barley, maize, wheat bran, soybean, NaCl and a

mixture of minerals and vitamins at the following proportions 270, 270, 270, 180, 1.7 and 1 g/kg de DM, respectively.

Weights were taken every week to evaluate the variation of the weight and daily gain weight along the experiment.

RESULTS AND DISCUSSION

Table.	1.	Diet	composition
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Ingredients	T1	T2
Wheat straw (60%)	1.5	1.5
Date pits (200g)	-	200g
Concentrate (40%)	1	1

	Mean	39.6	40.1	40.8	41.9	43	44.2	45.7	47.6
	Total	238	241	245	251.9	258	265.6	274.5	286.1
	6	39	40	40	41	41.8	42.8	43.9	44.9
	5	40	40	41	42	42.9	43.9	44.9	45.9
	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	49	51						
	3	49	49	50	52	53.4	55	57	59
62	2	35	35	36	37	38	39	40	41
G2	1	0	0.125	0.142	0.25	0.25	0.25	0.25	0.25
	1	33	34	34	35	36	38	40	42
	Mean	42.8	43	43	43.1	43.46	44	44.93	46.6
	Total	257	258	258	259	260.8	264	269.6	279.6
	6	47	47	47	48	48.8	48	49	50
GI	5	45	47	$2^{2''}$ $3^{3''}$ $4^{1''}$ $5^{1''}$ $6^{1''}$ W W W W W 47 46 46 46 47 40 40 41 42 38 39 40 41 42 39 39 39 39 39 47 47 46 45 46 47 47 48 48.8 48 58 258 259 260.8 264 43 43 43.1 43.46 44 34 34 35 36 38 125 0.142 0.25 0.25 0.25 35 36 37 38 39 49 50 52 53.4 55 43 44 45 46 48 40 41 $42.42.9$ 43.9 40 41 41.8 42.8 441	47	49			
C1	4 39 39 39 39 39 39 39 5 45 47 47 46 45 46 6 47 47 47 48 48.8 48 Total 257 258 258 259 260.8 264	39	41						
Diets	3	39	38	39	40	41	42	43	44
Diets ²	2	40	40	40	40	41	42	43.6	45.6
	1	47	47	46	46	46	47	48	50
	Animaux	${}^{1}\mathbf{W}$	W	W	W	W	W	W	W
A :	. .	1^{st}	2^{nd}	3 rd	4^{th}	5 th	6^{th}	7 th	8^{th}

 Table 2. Weights of the animals (kg) ingesting of diets containing 60WS or 60MIX with date pits

¹W: week; ²G1: 60:40 Wheat Straw: Concentrate; G2: 60:40: Concentrate.

The addition of date pits in the basic ration formed by wheat straw was accompanied with an increase of the average weight of animals (39.6kg initial average weight to 47.6kg at the end of the experiment). Whereas the group of animals fed a diet based on wheat straw and concentrate, shows an increase of weight equal to 3.8kg between the first and the last weight. With an initial average weight equal to 42.83kg against a final average weight equal to 46.6kg.

The same tendency was observed for the average daily gain weight (GMQ) with a net improvement of daily gain weight of diets containing date pits. The daily gain weight of the second group was between 71.4g and 240.4g/j.

Furthermore, the animals of the second group (G2), showed a total daily gain weight of 133.6g/d. Incorporated date pits had a significant effect on the daily gain weight of lambs. These results are comparable to those reported by several authors [8]; [9]; [10]; [11]; [12]. Whereas Dabbeb, 2005 [13] indicated that the incorporation of date seeds at a percentage of 10 and 20% of the ration did not show any increase of the growth rate in comparison with the control group.

Table 3. Evolution	of	daily	gain	weight	of	yearlings
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Average Daily gain weight (g)	Group1	Group2	SEM ¹
DGW1	23*	71*	0.113
DGW2	0	83	0.072
DGW3	185*	145*	0.069
DGW4	375*	145*	0.072
DGW5	104.1	157.5	0.052
DGW6	166.7	187.5	0.086
DGW7	208.3	240.4	0.051
DGW total period	62.7*	133.6*	0.023

¹W: week; ²GI: 60:40 Wheat Straw: Concentrate; G2: 60:40: Concentrate, Mean values within a row differ (P<0.05). Al Owaimer et al., 2011 [8] indicated that the contradictory results reported in previous works on date seeds might be due to the different proportions of the concentrate compounds in the ration, to the differences in ovine breeds used as well as to the different periods during which animals were submitted.

CONCLUSION

In conclusion and from the obtained results, it appears that the incorporation of date seeds to a ration based on wheat straw and concentrate has a positive influence on the improvement of animals weight and consequently on their daily gain weight. It has to be noticed that date seeds constitute a good source of cellulose and therefore of energy. Nevertheless, due to the low content of nitrogenous matter in these by-products, it is necessary to complement the ration of proteins.

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