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NUTRITIONAL PRELIMINARY CHARACTERIZATION OF SOME VARIETIES OF DATES AND PALM DOWNGRADED AS RUMINANT FEED

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ORIGINAL ARTICLE

ABSTRACT: *In Saharan regions, the date palm which forms the backbone of agriculture, offers a wide range of agricultural by-products, traditionally used for domestic purposes. The determination of chemical composition and nutritional value of these byproducts for rational use in feeding livestock is needed. The analysis showed that the byproducts of palm have total nitrogen content (CP), lipid (FAT) and (CB, NDF, ADF and ADL) also with a higher nutritional value close to that of straw and hay. The scrap value of dates offers a relatively high energy (0.87 UFL / kg DM) which is comparable to the concentrate feed but with relatively low levels of nitrogen or the need for supplementation or nitrogen treatment.*

Keywords: *Food, chemical, palm oil, scrap dates, nutritional value*

INTRODUCTION

The date palm is a hardy tree adapted to drier parts of the world. It is a monocot tree, the family or palmaceae phoenicicacées coryphinées subfamily, genus and species phoenix dactylifera. It is the main source of living of the Saharan population and for their livestock. Use of date palm by-products in animal feed has long been practiced by local farmers in a traditional way (Chehma et al., 2000). By-products or waste of dates or sorting gap are conventionally used as adjuncts in southern Tunisia (Genin et al., 2004) and are mainly waste of dates, followed, to a lesser extent, pedicels dates and dry palms (Boudechiche et al., 2008a).

The study of their nutritional value has yielded results placing the scrap dates in the category of concentrated energy feed with 0.94 UFL / kg of dry matter. In this same context, Genin et al. (2004) reported that there is a high concentration of energy waste in dates and nuclei, high levels of fiber in the stalks and leaves. By cons, in all cases the levels of crude protein (CP) are low (3 to 6.5% DM).

The results of the nutritional value obtained by Harrak et al. (2005); Boudechiche et al.(2008a and b) rank the byproducts of date palm in 2 categories; scrap dates as concentrated energy food, and the palms dry and coarse stalks as feed, similar to straw or hay of poor quality. Indeed, scrap dates, recording a 0.85 UFL, 0.84 UFL, and 0.81 UFV / kg DM can be classified as concentrated energy, which can even replace the grain (barley, oats. .. etc..), while dry palms and pedicels record, respectively, values of PDIE, 43.87 and 26.29 g / kg DM, against 35.44 g / kg DM for barley straw , the energy values of 0.20 UF, 0.39 UFL, 0.31 and 0.34 UFV, 0.45 UFL, 0.36 against 0.35 UFV, 0.50 UFL, 0.50 to UFV barley straw and nitrogen values in g / kg DM, 22.94 and 20.03 against 16.51 for barley straw. However, we must note that these products are low in nitrogen; their use requires supplementation or nitrogen treatment. Chehma et al. (2003)

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showed that the refuse of dates can be incorporated in diets of young sheep for fattening. Indeed, their use in place of barley in the diets of growing sheep has resulted in superior performance by weight and better feed efficiency. The three rations allow increasing amounts of waste growth rates higher than those obtained with the diet based on barley alone. That is a wise use of these products as part of our work, which is a study of the chemical composition and nutritional value, for use in livestock feed.

MATERIALS AND METHODS

Rootstock

Twenty varieties: Ten-product Palms (Angou, Aligue, Degla, Horra, Gondi, Akhwat, Arechti, Ghares, Gasbi, and Kintichi) and ten scrap dates (Bejou, Kintichi, Deglat, Manakher, Zehdi, Akhwat, Khalt, Kenta, Tantabecht, Aligue) from Tunisian oasis were selected for this study.

Analytical Methods

Samples of different plant species studied were analyzed for their dry matter (DM), organic matter (OM) mineral content (MM), total nitrogenous matter (CP) and lipid (FAT) according to AOAC (1990). The total fiber (NDF) are obtained after dissolution under the action of a neutral detergent sodium content of Acid Detergent Fiber (ADF) was measured in the presence of cetyl trimethyl ammonium Brome and lignin (ADL) is determined on the ADF residue subjected to the action of sulfuric acid solution at 72% (Van Soest et al., 1991).

The energy and protein values of oat hay expressed UFL / kg DM have been deduced by applying the formula Sauvant (1981).

UFL / kg DM = (1.218 (100-water - MM) + 0.11 CP - 1.81CB + 1.26 FAT) / 100
PDIE (g / kg DM) = 5.14 CP - (4.8 * CP * 0.4) - 0.8 CB + 68.8 MO/100
PDIN (g / kg DM) = 7.44 CP - (2 * CP * 0.4) + 1.2 MO/100

RESULTS AND DISCUSSION

Chemical composition

The dry matter of different varieties of palm by-products and scrap dates ranged from 83.8% to 90.9% which is comparable to the results of Belguedj (2000) and Boudechiche et al. (2008b) for the byproducts of Moroccan and Algerian oasis . These percentages are relatively high dry matter tell us about their freshness, hence their use as such, without drying. The levels of crude protein (CP) are higher for the byproducts of palm (11.53% for Kintichi and 18. Aligue to 03%) these values are close CP seed protein. While scrap dates for percentages of CP very low (3.33 to 6.31%). However, all varieties have been several studies by different authors in various countries have shown that the dates were deficient in protein and should be supplemented by a supply of nitrogen. It is therefore necessary to correct the deficit protein in order to enhance their dates and waste in animal feed by mixing them with food to fill this gap (Estanove, 1990).

On the lipid content (FAT), it is acceptable to the byproducts of palm and very low or even zero for scrap dates. This result concurs with that of Chehma et al. (2007). In terms of CB, we find that the results obtained have a very low rate for scrap dates with an average 7.43% DM of varieties, against relatively high rates for the dry stalks of palms that record an average grade of 34.11% which is similar to what is reported by Genin et al. (2004) and Chehma et al. (2007). This low rate of CB scrap dates is because they represent a much richer fruit sugar cytoplasmic. For the composition of the wall, we see that dry palms are the greatest rate of NDF. This is due to the physical consistency of the 4 sub-products, which depends on the phenological part occupied by each of these sub-products (pedicel and fruit). Similarly, for the same reasons, the content of other components of the wall ADF and ADL is variable, and dry palms are always higher rate, while trash dates record the lowest rates as shown in Table 1.

Food values

The scrap of dates offers a relatively high energy value (0.87 UFL / kg DM) which is comparable to the concentrate feed (Table 2). That is why it is used as an energy supplement in lieu of barley, mainly for the sheep (Boudechiche et al., 2008b). While for the by-product of palm, they are compared to straw and hay of poor quality for their low energy value. The amount of PDIE are comparable to the pedicels of palms and differential sorting of dates, they are in the ranges (70 to 90 g / kg DM) As for nitrogen values, it is high for the by-products of palm and very low for scrap dates so their use requires supplementation or N- treatment Chehma et al. (2003).

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Table 1 - Chemical composition (% DM) and wall-products of palm and waste of dates

		DM (%)	MM	OM	CP	FAT	CB	NDF	ADF	ADL
Byproducts of palm	Angou	86.54	5.3	94.6	15.42	6.6	36.55	89.44	65.3	20.45
	Aligue	89.3	5.44	94.55	18.03	5.6	30.5	83.04	53.88	22.45
	Degla	84.94	5.74	93.06	15.14	6.94	31.22	88.87	64.12	21.02
	Horra	85.44	3.46	96.54	16.13	5.74	33.5	85.12	58.9	23.11
	Gondi	85.63	3.46	96.54	12.56	5.2	33.1	87.1	61.58	25.4
	Akhwat	84.12	9.63	90.37	12.56	5.2	33.89	82.5	66.02	22.78
	Arechti	89.2	3.62	96.38	16.26	4.2	35.25	88.99	58.7	21.21
	Ghares	81.28	5.3	94.7	13.48	4.7	36.2	89.01	66.47	22.02
	Gasbi	88.76	7.98	92.02	14.77	4.7	34.34	89	67.12	23.28
	Kintichi	90.92	2.97	92.99	11.53	4.4	36.55	86.86	66.03	25.88
Waste of Dates	Bejou	84.3	3.6	96.4	3.78	0.24	9.53	24.39	12.94	8.03
	Kintichi	89.2	2.97	97.03	3.33	0.42	8.5	21.6	13.6	6.51
	Deglat	90.3	2.28	97.72	4.33	0.08	7.4	22.2	18	4.82
	Manakher	85.1	2.44	97.56	5.07	0.7	6.2	22.1	17.7	3.92
	Zehdi	87.7	3.68	96.22	6.31	0.06	5.88	24.06	14.03	4.06
	Akhwat	87.5	2.5	97.5	4.93	0.4	9.6	26.35	17.8	5.01
	Khalt	88.5	3.56	96.44	3.94	0.6	7.7	27.1	12.22	6.75
	Kenta	86.8	2.38	97.62	4.53	0.32	8.8	26.6	17.7	4.44
	Tantabecht	83.8	1.86	98.14	4.3	0.07	5.5	25.23	17.77	4.74
	Aligue	88.3	4.04	95.96	3.74	0.5	5.22	22.12	18.12	3.82

Table 2 - Values of food-products and waste palm dates

		UFL /kg DM	PDIE, g/kg DM	PDIN, g/kg DM
Byproducts of palm	*Angou*	0.30	89.5	103.52
	Aligue	0.45	99.16	120.85
	Degla	0.4	87.8	101.64
	Horra	0.36	91.55	108.25
	Gondi	0.367	80.37	84.55
	Akhwat	0.25	75.5	84.4
	Arechti	0.35	90.46	109.12
	Ghares	0.21	79.59	90.64
	Gasbi	0.31	83.39	99.17
	Kintichi	0.29	71.86	77.67
Waste of Dates	*Bejou*	0.86	78.3	26.03
	Kintichi	0.88	70.67	23.27
	Deglat	0.91	70.14	29.83
	Manakher	0.88	78.48	34.84
	Zehdi	0.9	81.8	39.85
	Akhwat	0.83	75.28	33.9
	Khalt	0.87	72.88	27.31
	Kenta	0.84	74.71	31.25
	Tantabecht	0.88	76.97	29.72
	Aligue	0.94	73.89	25.98

CONCLUSION

The results obtained show that the refuse of dates can be incorporated into the rations of farm animals in arid areas during periods of food unavailability replacing all or part of the concentrate imported reverberating both beneficial the national economy and to provide an outlet for the sector dates. Indeed, for a balanced diet, one must note that these products are low in nitrogen; their use requires supplementation or nitrogen treatment. It would be interesting scientifically to continue this work to better characterize these products by determining the kinetics of production of total gas and methane, digestibility "situ" of organic matter, total volatile fatty acids and metabolizable energy.

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