

Review: The Effect of Using Discarded And By-Product of Dates Palm In Ruminant's Performance

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Abstract: According to increasing prices of concentrate feeds around the world which lead us to search for an alternative traditional concentrates, that became a big concern to ruminant breeders. Dates are not suitable for human consumption, palm fronds and date pits are considered the wastes as a good alternative feed which can be high utilized efficacy by ruminants. These residues are characterized by high carbohydrate as an energy source and cellulose, hemicelluloses and lignin which are essential for ruminant diet. All researches proved the possibility of using these wastes in the field of feeding ruminants, because of the improvement in the performance of the animal, increased intake, weight gain and digestion coefficient.

Key words: date palm , date pits , palm fronds, Growth trial and digestibility

1. INTRODUCTION

The lack of feed of all kinds due to the lack of pastures and the allocation of lands for cultivating concentrated and green fodder to be determined From animal husbandry, it is important to find other feed substitutes such as agricultural and industrial waste, whose energy content is low and protein date waste and its industries are unconventional and locally available feed for ruminants (Ahmed and Al-Dabeeb, 2000) among these wastes the dates are not suitable for human consumption which are damaged or poor quality or old as well as palm residues such as palm fronds (Al-Saadi, 2004 and Hassan, 2004) and wet date nuclei (Khalifa, 2005) and nuclei crushed dry dates (Judy, 2011), and can be added as energy-rich sources (Ahmed ,et.al., 2001), as they contain energy relatively high compared to concentrated feeds, but it has a low nitrogen content, so it needs nitrogen additives or treatments(Selmi et al., 2011) and a high fiber content of up to 19% of what was determined to be added to the feed (Boudechiche, et .al 2009) date palm trees can produce up to 13.5-20 kg of dry fronds annually (Chehma and Longo, 2001). Other wastes such as date pits represent an average of 10% of the date fruits (Ministry of Agriculture, 2013; Barreveld, 1993). Although these agriculture wastes consist of cellulose, hemicelluloses, lignin and other compounds which could be used in many biological processes, they were burned in farms causing a serious threat to the environment. This review aims to add different sources and levels of date palm nucleus of crushed dates and dates that are not suitable for human consumption and the damaged or poor quality dates, as well as palm residues such as palm

fronds, wet dates and crushed dry dates and its effect on growth , feed conversion ratio and digestibility coefficient of nutrients

1-Date palm pulp

1-1- Dates and palm fronds

It is the result of the sieving process after the harvesting, which is poor quality and non-marketable dates for human consumption that can be recycled in the animal feed and used as animal feed in concentrated ruminants' feeds (Ahmed and Al-Dabeeb, 2000) or as supplementary animal feed pasture, studies proved that it contains a high proportion of nutritional energy, is approximately equal to the energy found in conventional fodder sources such as corn, barley, wheat bran, etc (Selmi et al., 2011). As for palm fronds given the low nutritional value of date palm fronds, farmers do not care much about animal feeding these byproducts. The concentration of crude protein for palm fronds is usually low 5-7% (Genin, et al. 2004; Medjekal et al. 2011). Ziaei and Sharifi Hosseini (2009) mentioned that the ratio of crude protein in palm leaves (fronds) is 16.5 g / kg on a dry matter basis.

1-2- Chemical composition of by products of dates palm

The cores represent about 25% of the fruit, so we can imagine the amount of cores left from the manufacture of dates (Awadalla et.al.2002). On the other hand, the quantity of poor dates available annually and not suitable for human consumption is not constant from one year to the next and its quantities can be estimated at 20-30% of the annual production (Babiker, 2010). The chemical composition of the nuclei varies according to the type of crop, but this difference is simple and it can be said that the chemical composition in general is as it is. The nuclei of the date palm are rich in carbohydrates and to some extent in fat and protein (Al-Dabeeb, 2005). The chemical composition is organic matter (95.99), crude protein (7.84), crude fat (2.88), crude fiber (13.76), carbohydrate (71.51), ash (4.01) according to (Youssef and Fayed 2001), Organic matter (90.19), crude protein (9.61), crude fat (2.97), crude fibers (15.47), carbohydrates (62.14) and ash (9.81) (Fayed, et.al. 2001). Dates through several studies were conducted in the following proportions: moisture approximation 5-10 protein 5-7 fat 7-10 ash 1-2 and carbohydrates 55-65% (Abdel Basit, 2013) in addition to the following elements: zinc, potassium, sodium, copper, calcium, phosphorus, manganese chloride and iron, in addition The nutritional value of fruits (Babiker, 2010).

2- The effect of using palm residues on feeding ruminants

2 -1 Growth trial

The results of Elgasem et al. (1993) study indicated that the nucleus contains more amounts of protein, crude fiber, crude fat and dry matter compared to pulp of the fruits were added by 0, 10, 20 and 30% to the diet. It was observed that the sheep fed on the date residues increased their weight faster than those that did not feed on waste. Elhag et al. (1993) found that the kernel-free diet (80% of barley) gave the highest daily increase rates in Awassi sheep and the best nutritional efficiency compared to the two feeds containing 80% and 40% kernel, respectively. This research appeared that date kernel may not be equal to barley when used as a primary source of energy in sheep's diets. However, at the same time it does not differ greatly from it when used for this purpose. The fact that the benefits of the date kernel will have a nominal price as expected compared to traditional barley feed. These results were consistent with the findings of (AL-Owaimer et. al.2008; Judy, 2011; Al-Shanti et al. 2013 and Hassen et.al.2015) the date nuclei can replace barley in growth diets, whereas

Al-Ghazali (2009) found that no significant differences in treatment containing 34% crushed date nuclei treated with the probiotic in feeding Awassi lambs . It also did not agree with what Khalifa (2005) found when replacing the nuclei of wet dates in place of barley by 50% and with Abdou et al. (2011) when feeding Awassi lambs on the nuclei of dates and compared to barley, whereas AL-Banna et al. (2010) pointed that did not increasing weight of lambs fed diets containing crushed date nuclei with by substituting ratio 50 and 75% from corn and barley compared to 0 and 100%, and also did not agree with AL- Owaimer et al. (2011) who obtained the highest final weight of adding date nuclei by 15 and 30 % Compared to 0 and 45% when feeding lambs . Ahmed et.al. (2014) explained that feeding of lambs on the following diets 0, 10 and 20% whole dates and 0% 10 and 20% whole crushed dates instead of barley. Crushed dates were better than whole dates in case of substitution instead of barley in relation to the total weight gain and feed conversion ratio .On the use of dates as an energy source in sheep fattening diets, Hmeidan et al. (1993) conducted a digestion experiment using local rams from the Najdi strain. As for the diets used in the experiment, it was more compared to (without dates) and the rest was a 11%, 22%, 33 %, and 44%, respectively. The results indicated that it is possible to add dates of poor quality as part of the mixture of dates and hay component to sheep fattening diets and the percentage of 33% did not leads to any negative results on the factors of digestion of nutrients and benefit from energy and nitrogen balance. While the results showed that adding dates at 44% as a substitute for corn and barley in the diet, leads to a decrease in food and energy digestion coefficients and in taking advantage of food nitrogen.

As for Elhag et .al. (1993), they fed Awassi sheep with diets containing ratios of 15, 25% and 35% on the basis of the dry matter from the excluded dates. The study showed a significant increase in the intake and efficiency of feed conversion ratio and digestion rate within the ratios 25, 35% some researchers have found that adding damaged or excluded dates by 30% to the diets of concentrated lambs that show an increase in the rate of weight gain due to the improvement in the level and type of the feed (AL - Dabeeb 2005). AL-Banna et al. (2010) explained that lambs when feeding on crushed palm fronds by 600 g / day as coarse feed and replacing three proportions of corn and barley for the concentrated diet with crushed dates nuclei treatment was 0, 50, 75 and 100% respectively, experiment showed significantly increased in live weight gain with the ratio of 50 and 75 nuclei date compared to the control treatment and 100% nuclei date and the average daily weight increase ranged between 283.3-300g/day.

On the other hand, Al-Hamidi (2011) found that adding quality or excluded dates at different levels (0, 15, 30%) to ruminant diets resulted in an increase in the daily weight, the best increase occurred was 210,98 g / day in lambs fed on a diet containing 30% dates , Ibrahim (2012) showed that the use of feed cubes containing dates and various nitrogenous sources affected significantly ($P < 0.05$) in the amount of feed consumed in the daily intake of dry matter, organic matter, crude protein and dissolved carbohydrates, whereas ,(Lazem et al. 2012) indicated that 34% of corn were replaced by date nuclei date by adding yeast or probiotic to improvement in lambs performance with crushed dates and dates after extraction (pulp dates) compared to corn cob as well as it did not significantly affect the final weight and the overall weight increase. Abbes (2013) in an experiment conducted on Awassi lambs that feeding different percentages of dates 0, 10 and 20% were substituted with two nitrogen sources either soybean or urea showed an increase in the amount of intake at the level of 10% of dates, possibly due to an increase in the Palatability of the diet .

This disagree with Al-Suwaiegh (2015) fed Saudi goats four (0, 10.15 and 20) % progressive ratios of date nuclei and was decreased of amount nutrients consumed. While, increase in the efficiency of feed conversion and daily weight in the level 0 and 20% of nuclei compared to the 10% level and no significant differences in level 15%. In a subsequent study, Al-Suwaiegh (2016) found that goats feeding diets of alfalfa hay (0, 10, 20 and 30%) were replaced by palm fronds treated with urea and the same proportions in concentrated (0, 10, 20 and 30)% were replaced by date nuclei result appeared significant increase in the amount of dry matter intake and feed conversation ratio for levels 10/10 and 20/20 compared to treatment 0/0 and 30/30. Abo Omar and Al Shanti (2017) revealed that fed Kids goats crushed date pits at levels 0, 15, 30 and 45%, in the control and treatments Consumed more ($P < 0.05$) feed (0.81, 0.92, 0.91 and 0.92 kg for kids treatments one to four, respectively) but gained less ($P < 0.05$) weight compared to those fed the control diet .This is similar to Mohammed Khair (2019) found that fed goats the kernel of date powder ratios 10% Molasses, 10 nuclei date + 5 Molasses% and 20% nuclei date .Experience showed that a significant third treatment in the rate of feed consumption and increase the live weight as compared to the first and second treatments.

2- Digestibility

EL- Hag and EL - Khangari (1992) found that when feeding goats on palm residues (leaves and cores) a significant increase in laboratory digestion coefficient in the neutral and acid detergent fiber (NDF and ADF) this result agree with (Elhag et. al. 1993) when used of proportions 25, 35% of excluded dates resulted in a significant increase in digestion coefficients .

Al-Owaimer et al. (2011) also indicated that the digestion coefficient for acid fiber extract and crude protein increases with the increase in the date nuclei ratio and the decrease in the digestibility factor of the nitrogen-free extract in the feed provided for lambs and this is similar to (Mahmoud and El-Bana, 2013) found when feeding camels to Barley and palm leaves, Ahmed et.al. (2014) indicated that the results of their study show that the percentage of whole dates and crushed added dates by 0, 10 and 20 instead of barley showed no significant differences in the digestion coefficient of dry matter, organic matter and crude protein, while organic matter and crude protein were significant ($P < 0.01$).while , in relation to the overlap between the dates and the physical form, significant differences ($P < 0.05$) were observed for the crude protein digestibility coefficient (Abbes, 2013) when feeding Awassi lambs three levels of dates from 0, 10 and 20 % with two nitrogen sources, either soybean or urea noticed improvement of the digestibility of dry and organic matter. This is inconsistent Al -Suwaiegh (2015) appeared that fed the Saudi goats had four progressive ratios of date nuclei and was (0, 10.15 and 20)% significant increase in($P < 0.05$) in the digestibility coefficient of dry matter, organic matter, crude protein and neutral fiber extract for levels 0 and 20% nuclei dates compared to level 10 and 15%. In another study (Hassan, et. al., 2015) showed that improved the digestibility coefficient of the nitrogen free extract and the crude fiber.

Salama, et . al.,(2019) indicated that the use of increasing rates of date seeds 0, 25, 50, 75,100 with and with out bacterial treatment (Aceto-bacter xylinum and Thermonospora fusca) to improve chemical composition of date seed and inviter digestibility specially ration contain 25% from total dry matter. Lqbal ,et.al.(2019) revealed that in experimental, they were fed with rations supplemented with (0, 10, 20, and 30%) discarded date palm on dry matter (DM) basis, respectively. The dry matter intake (DMI) significantly increased

($P < 0.05$) in groups 20 and 30% Significant differences in dry matter digestibility (DMD) were noted among groups with mean values (50.2, 56.4, 65.2 , and 72.2%) respectively.

3. CONCLUSION

This study concludes that it is possible to configure the diet of some remnants of palm used in the feed (sheep and goats) without any detrimental effect on her life there for was a clear reduction in the cost of food production kg of live weight for sheep and goats can be deduced that it can be used to replace barley nuclei dates crushed or the powder and dates extracted palm leaves and palm leaves to improve the performance and growth of sheep and goats.

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