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Impact of date-based energy bar intake on postprandial appetite, metabolism and thermogenesis

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Research studies suggest that date-palm (*Phoenix dactylifera* L.) fruits provide a superior nutritional and health benefits, compared to other fruits ⁽¹⁾. They are rich source of many essential nutrients including carbohydrates, dietary fibre, vitamins, minerals, phytochemicals, and antioxidants. The date palm fruits are produced in many countries around the world and about 10-15% of the total production is lost or sold extremely at low prices ^(2,3). Despite these, date fruits have been rarely used as an ingredient in commercially available energy bars. The aim of this study is to investigate the impact of newly formulated date-based energy bar (DBEB) ⁽⁴⁾ intake on subjective appetite, postprandial metabolism, energy substrate oxidation and diet-induced thermogenesis (DIT).

Twenty-seven healthy male adults (mean \pm SD, aged 20.8 \pm 3.5 years with body weight of 66 \pm 8 kg) participated in a randomised crossover design study. Each participant conducted two experimental arms and was investigated prior to (baseline) and for three-hours after consumption of either a date-based energy bar (DBEB) or an isocaloric and macronutrient matched mixed fruit-based energy bar (FBEB) as control arm. The DBEB contained significantly less fructose and glucose, but more sucrose and fibre than FBEB. Both experimental arms involved blood sampling, subjective appetite, and indirect calorimetry measurements. At the end of each experiment, an *ad libitum* buffet meal was provided. Data analysis used descriptive statistics, paired t-test, and two-way ANOVA.

Time-averaged composite appetite and satiety scores were not significantly different between control (FBEB) and DBEB arms. Energy intake during *ad libitum* buffet was also not different between arms. Metabolic rate measured at baseline and during post-ingestion of the bars were not significantly different between FBEB and DBEB arms (arm effect, $P > 0.05$). Thermic effect of bars calculated as percentage increase in metabolic rate above RMR during whole postprandial duration was (mean \pm SE) 9.5 \pm 1.6 % in DBEB arm and 8.7 \pm 1.3 % in the FBEB arm (arm effect, $P > 0.05$). Rates of carbohydrate and fat oxidation were also not different between the two arms (arm effect, $P > 0.05$). Time-averaged concentrations of blood glucose, insulin and triglycerides were similar between the study arms.

The obtained results suggest that energy bars based on dates or mixed fruits produce similar effects on postprandial appetite, fat and carbohydrate oxidation, thermic effect and cardiometabolic risk factors. Date fruits can be used as rich source for carbohydrate and energy. However, future research should investigate the impact of date-based energy bars on antioxidant capacity and other health related markers.

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