

## The effects of date and date seed powder on blood biomarkers, a crossover study

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### Abstract:

The blood biomarkers were measured at baseline and after consuming 30 g date seed powder or 50g seedless date fruit daily for 28 days. The PLS-DA model separated participants into two groups (date seed powder as X variable and timepoint as Y variable; model parameters  $R^2Y = 0.77$ ,  $Q^2Y = 0.61$ , Cross-Validated-ANOVA  $p = 0.0002$ ). The Variable Importance in Projection (VIP) discriminative variables, including TG, CRP, FBS, RBC, and RDW, were analyzed using univariate data analysis and found to be significantly different before and after date seed powder intervention ( $p < 0.05$ ). The results showed a significant reduction in TG, CRP, and FBS and an increase in RBC and RDW ( $p < 0.05$ ). None of the fitted models for date fruit intervention was significant regarding  $R^2Y$ ,  $Q^2Y$ , or CV-ANOVA.

In the current study, date seed powder as a high polysaccharide content source led to a significant reduction in CRP concentration. It implies that date seed polysaccharides reduced colon pH by higher production of SCFAs and improved the growth of beneficial microorganisms in the intestine, reducing inflammation. Although date seed powder significantly ( $p < 0.05$ ) reduced blood TG, more investigation is needed to elucidate the exact TG reduction mechanism of DSP. High FBS ( $\geq 126$  mg/dl) is one of the most important biomarkers for the diagnosis of diabetes. Although, in the current study, the participants' FBS level was in the typical medical range (84 to 99 mg/dl), a significant reduction was observed after DSP intervention. An increase in RBC after date seed powder intervention could be described by the anti-erythrocytes' hemolysis effect of polysaccharides due to date seed powder antioxidant activity. Consequently, the date seed intervention significantly reduced TG, CRP, FBS, and erythrocyte hemolysis.

### Keywords:

Phoenix dactylifera L.; Three glyceride; CRP, Clinical trial; Inflammation