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Response to Comment on Effect of Drying of Jujubes (*Ziziphus jujuba* Mill.) on the Contents of Sugars, Organic Acids, α-Tocopherol, β-Carotene, and Phenolic Compounds

We are responding to comments from Dr. John S. Salter Jr. and Dr. Jonghoon Kang of Valdosta State University on our recently published paper.[1] Before responding to these comments, we would like to restate the rationality of our work. The main objective was to evaluate the effect of drying of jujubes on the contents of sugars, organic acids, α-tocopherol, β-carotene, and phenolic compounds. Drs. Salter and Kang analyzed the 12 variables (1, vanillic acid; 2, glucose; 3, ferulic acid; 4, fructose; 5, cinnamic acid; 6, rutin; 7, protocatechuic acid; 8, ABTS; 9, TPC; 10, malic acid; 11, citric acid; 12, succinic acid) of our data with principal component analysis (PCA). However, catechin and epicatechin were the two main phenolic compounds in our study, and vanillic acid and ferulic acid as well as cinnamic acid selected by Drs. Salter and Kang are in small amounts. Furthermore, β-carotene is the most common carotenoid in fruits.[2] α-Tocopherol is the most important lipid-soluble antioxidant.[3] Many studies have demonstrated that there are strong interactions between β-carotene and α-tocopherol based on their antioxidant effect,[4−6] but α-tocopherol and β-carotene evaluated in our paper were not analyzed in their comment.

However, we appreciate much of the comment from Drs. Salter and Kang for analyzing our data with PCA. PCA is a mathematical tool that performs a reduction in data dimensionality and allows the visualization of underlying structure in experimental data and relationships between data and samples.[7,8] Therefore, PCA introduced in their comment may be applied to the evaluation of other food-processing methods.

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Notes

The authors declare no competing financial interest.

REFERENCES

(1) Gao, Q. H.; Wu, C. S.; Wang, M.; Xu, B. N.; Du, L. J. Effect of drying of jujubes (*Ziziphus jujuba* Mill.) on the contents of sugars, organic acids, α-tocopherol, β-carotene, and phenolic compounds. *J. Agric. Food Chem.* **2012**, *60*, 9642−9648.

(2) Paiva, S. A.; Russell, R. M. β-Carotene and other carotenoids as antioxidants. *J. Am. Coll. Nutr.* **1999**, *18*, 426−433.

(3) Brigelius-Flohe, R.; Kelly, F. J.; Salonen, J. T.; Neuzil, J.; Zingg, J. M.; Azzi, A. The European perspective on vitamin E: current knowledge and future research. *Am. J. Clin. Nutr.* **2002**, *76*, 703−716.

(4) Böhm, F.; Edge, R.; Land, E. J.; McGarvey, D. J.; Truscott, T. G. Carotenoids enhance vitamin E antioxidant efficiency. *J. Am. Chem. Soc.* **1997**, *119*, 621−622.

(5) Böhm, F.; Edge, R.; McGarvey, D. J.; Truscott, T. G. β-Carotene with vitamins E and C offers synergistic cell protection against NOx. *FEBS Lett.* **1998**, *436*, 387−389.

(6) Zanfini, A.; Corbini, G.; La Rosa, C.; Dreassi, E. Antioxidant activity of tomato lipophilic extracts and interactions between carotenoidsand α-tocopherol in synthetic mixtures. *LWT−Food Sci. Technol.* **2010**, *43*, 67−72.

(7) Jiménez, A. M.; Sierra, C. A.; Rodríguez-Pulido, F. J.; González-Miret, M. L.; Heredia, F. J.; Osorio, C. Physicochemical characterisation of gulupa (*Passiflora edulis* Sims. fo edulis) fruit from Colombia during the ripening. *Food Res. Int.* **2011**, *44*, 1912−1918.

(8) Patras, A.; Brunton, N. P.; Downey, G.; Rawson, A.; Warriner, K.; Gernigon, G. Application of principal component and hierarchical cluster analysis to classify fruits and vegetables commonly consumed in Ireland based on in vitro antioxidant activity. *J. Food Compos. Anal.* **2011**, *24*, 250−256.

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