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Use of organic acids to increase the stability of Brazilian red wines produced in tropical semi-arid environmental conditions: Quality evaluation based on consumer test and time-intensity analysis

A.C.T. Biasoto*[1], D.G.C. Freitas[2], G.E. Pereira[1,3], I.F.O. Rocha[4], M.L.F. Freitas[4], H.M.A. Bolini[4]

[1]EMBRAPA Tropical Semi-Arid, Brazil, [2]EMBRAPA Food Technology, Brazil, [3]EMBRAPA Grape and Wine, Brazil, [4]University of Campinas - UNICAMP, Brazil

The wines produced in the Sub-middle Sao Francisco Valley, important Brazilian winery region, are generally recommended to fast consumption. These products start to lose sensory quality attributes in about two years after bottling due to the environmental growing conditions. For example intense solar radiation reduces wine acid content. The objective of this research was to study the utilization of different organic acids to increase the stability of Brazilian 'Syrah' wines produced in tropical semi-arid environmental conditions. A mixture experimental design with three components variables was applied to optimize the acid addition to the wine. Tartaric, lactic and malic acids were added to the wine must, generating eight treatments (T1 to T8), plus a control without organic acid complement (T9). Eight trained judges rated the astringency and sourness of the wine by the Time-Intensity analysis methodology using a 10cm hybrid-scale. The samples were also evaluated by 44 wine consumers using a 9-point hedonic-scale. The dependent variables were overall acceptance, the maximum intensity of sourness and astringency, and the total time of duration of the stimulus of astringency and sourness. The wines T5 (50%malic+50% lactic acids), T3 (50%tartaric+50% lactic acids) and T6 (33.3% tartaric+33.3% lactic+33.3% malic acids) were the most accepted by the consumers. The T1 (100% tartaric acid) and T9 (control) wines obtained the worst linking scores. The wine T5 had lower notes of intensity of sourness and astringency, as well as the lowest time of total duration of the astringency stimulus in agreement their highest acceptance by consumers. In this study it was possible to conclude that adding organic acids to adjust the wine pH improved the sensory quality of the Brazilian 'Syrah' wine, which could be an important approach to solve the problem of stability loss of the Brazilian red wines produced in tropical semi-arid environmental conditions.

Keywords: wines, consumer acceptability, Time-Intensity analysis (TI), sensory analysis