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## Impact of different sucrose levels on silage fermentation quality and chemical composition of panicle-harvested quinoa

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### Abstract

Many studies have been conducted on evaluating quinoa as an alternative feed source through ensiling. However, there is no study available regarding the ensiling of quinoa by evaluating it as silage after harvesting the plant panicles in the early stage (45-50% DM) to obtain seeds. Therefore, in this study, silage fermentation quality and nutrient composition were investigated in the cultivars: Mint vanilla (cv. MV), Cherry vanilla (cv. CV), French vanilla (cv. FV), Red head (cv. RH), and Titicaca (cv. T) of quinoa containing high dry matter (QCHDM) using different sucrose doses (control, 20, 40, and 60 g kg<sup>-1</sup> FM). The QCHDM cultivars were grown in a randomized complete block design with three replications. The seeds of the QCHDM cultivars were harvested, and the remaining leaves and stems were chopped using a plant chopping machine and ensiling was performed with 5 replicates. The fermentation characteristics and nutrient contents of the silages were investigated. All the silage fermentation characteristics were significantly influenced by cultivar and sucrose dose, but only the characteristics of lactic acid bacteria, ammonia nitrogen, lactic acid, and acetic acid were affected by the interactions of the variables. As the sucrose dose increased, it was determined that the desired improvement in silage fermentation characteristics occurred. Except for ether extract and dry matter, all the characteristics examined in the silage nutrient compositions were significantly affected by cultivar and sucrose dose treatments. On the other hand, there were interaction effects on such properties as neutral detergent fiber, acid detergent fiber, acid detergent lignin, and crude ash. Finally, it was concluded that adding sucrose at a dose of 60 g kg<sup>-1</sup> FM to cv. FV of QCHDM could result in a higher quality silage in terms of fermentation quality and nutrient content. We have concluded that the findings of this study are highly significant in terms of dual-purpose quinoa cultivation.

**Keywords:** dual purpose, fermentation quality, high dry matter quinoa, nutritive value, silage

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