Effects of Drying Procedure, Cultivar, and Harvest Number on Capsaicin Levels in Dried Jalapeño Peppers

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Introduction

An issue that needs to be addressed is how to harvest and process peppers in order to obtain the highest capsaicin extraction for use in non-food applications. This study was undertaken to investigate this issue using jalapeño peppers as the test material. The objective of this study was to investigate the effects of cultivar, fruit color, harvest sequence, and drying parameters (pod physical condition, drying air temperature) on the levels of capsaicin in jalapeño peppers.

Results and Discussion

Observations on the jalapeño peppers planted in 2000 in East Tennessee revealed information pertinent to processing the peppers for non-food uses. The greatest harvest weight of pods occurred just after the first harvest of the season. The concentration of total capsaicinoids in fresh jalapeño peppers did not significantly change over progressive harvests and that there was no difference in total capsaicinoid concentration in green or red fresh peppers. These findings indicate that there is no need to sort fresh peppers in order to optimize processing.

Drying temperatures tested ranging from ambient (~27°C) to 85°C did not affect the concentration of total capsaicinoids in dried jalapeño peppers (Fig. 1). It is likely that higher temperatures could be used without affecting capsaicin levels; however, this maximum temperature needs to be determined. Physical condition of the peppers when dried (whole or cut) did not affect capsaicinoids concentration with the temperature range tested. Drying effectively concentrated capsaicinoids in the dried product by almost fifteen times the level in fresh peppers (Fig. 2). If drying is to be part of any extraction process then fast drying can be accomplished to reduce costs by using higher temperatures (within limits) and slicing the peppers for enhanced moisture transfer rates. If slicing is to be accomplished, care should be given to retaining the pepper seeds.
Figure 1. Variation in capsaicinoids with drying air temperature for harvest 3.
Figure 2. Effect of cultivar and drying procedure on capsaicinoids

This research represents one season's data and does not constitute recommendations. After sufficient data is collected over the appropriate number of seasons, final recommendations will be made through research and extension publications.