

Use of Sample Class Prediction for Improving Quality Control and Process Optimization in Agricultural Applications

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Abstract:

There is a growing demand for cranberry products because of the potential health benefits associated with consumption of cranberries. Cranberries are rich in polyphenolic compounds (proanthocyanidins, resveratrol) and there have been many published reports of the beneficial impacts of diets high in cranberries for treatment of ailments such as urinary tract infections; high blood pressure; cancer and other diseases. Cranberries are tart red berries produced by several plant species, but only the American cranberry (*Vaccinium macrocarpon*) indigenous to wetlands in central and eastern North America is farmed for commercial production. Most consumers associate cranberries as sauces and garnishes for holiday meals with the demand for cranberry products typically spiking during Easter, Thanksgiving and Christmas holidays. Cranberry producers are thus faced with a difficult challenge of optimizing their operations for growing, harvesting and storage of cranberries to meet these high demand times while also finding new markets for their products.

So what does this have to do with chemistry?

This talk will present an overview of a project that used analytical chemistry to develop multi-variate statistical models for producing a highly sophisticated class prediction algorithm for optimizing a cranberry operations that was in deep financial distress. In this talk I will discuss how my training as an analytical chemist was used to address tremendously difficult challenges faced by a cranberry producer (financial losses, process optimization) and how a multimillion dollar operations went from near bankruptcy to sustainable profitability. I will discuss how these problems could have only been solved by a chemist and hopefully provide some insight to graduate students contemplating possible future career opportunities where they can apply their scientific training in areas they may not have previously considered.