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EFFECT OF HIGH-METHOXYL PECTIN DOSE ON THE FUNCTIONAL PROPERTIES OF STRAWBERRY AND SOUR CHERRY JAM

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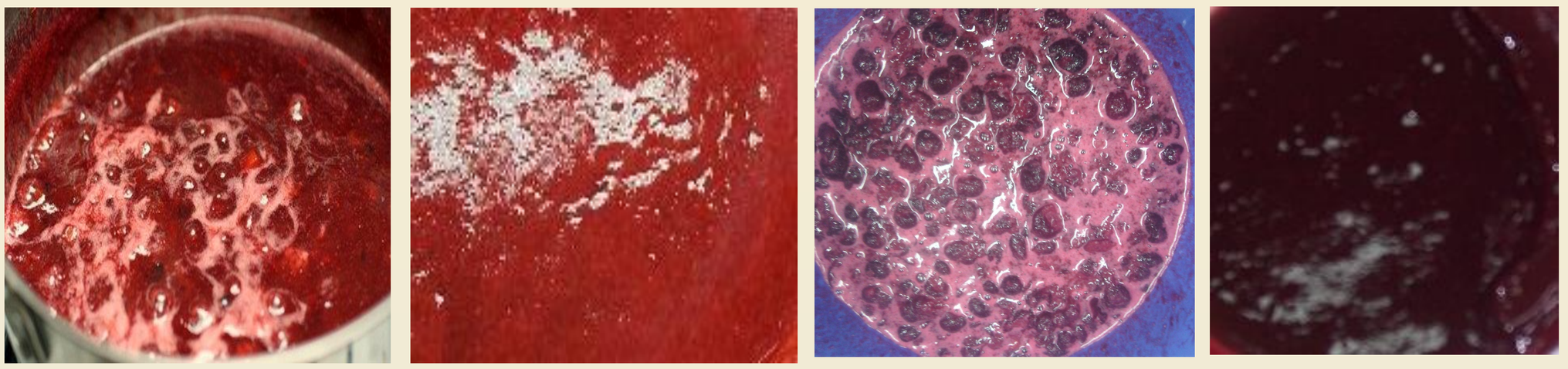
INTRODUCTION

Strawberries and sour cherries are produced in large quantities every year. Although much of this fruit is marketed fresh, significant quantities are made into shelf-stable products available to consumers throughout the year, the most popular product being jam. In view of the nutritional recommendations and health benefits, efforts are being made to obtain fruit products that preserve the bioactive potential of the originating fruit. Recently, there has been a growing interest in identifying valuable possibilities for preserving the antioxidant properties of products obtained by thermal processing of fruits rich in bioactive compounds. In this respect, a broad analysis is needed regarding the behavior of thermally processed products in relation to various factors. This study presents aspects of the impact of high methoxyl pectin (HMP) dose on antioxidant properties and bioactive compounds in strawberry and cherry jam stored for 1 day, 2 and 4 months at 20°C.

MATERIALS AND METHODS

Strawberry and sour cherry jam dormulations were prepared in the laboratory, according to a traditional procedure, by boiling in an open kettle under atmospheric pressure, with manual stirring. The final soluble solids content reached upon cooking was 65°Brix. Jam formulas were prepared with high-methoxyl pectin (Ceampectin MRS 4610) in doses of 0.4%, 0.7% and 1.0% relative to the quantity of fruit processed, the HMP being indicated for obtaining jam with a total soluble solids content of more than 60°Brix. The jam were filled into hot glass jars, capped and pasteurized at 80°C for 10 min. They were allowed to cool at room temperature and stored in the dark until analysis. The jams were analyzed one day after processing and after 2 and 4 months of storage at 20°C, respectively. The antioxidant capacity was determined by FRAP (Ferric Reducing Antioxidant Power) assay, the total polyphenol content by Folin Ciocalteau method and the total monomeric anthocyanin content by the pH differential method.

Figure 1. Boiling fruit with sugar to produce jam



RESULTS AND DISCUSSIONS

The registered FRAP values (Tables 1 and 2) do not denote a massive decrease in antioxidant properties suggesting that the polymeric forms resulting from the polymerization reactions of anthocyanin compounds exhibit antioxidant properties, thus compensating for the loss of antioxidant capacity due to the degradation of monomeric anthocyanin compounds. The results obtained show that thermal processing of garden fruits had a significant impact towards the reduction of bioactive compounds compared to jam storage. Thus, by increasing the pectin dose in jam recipe from 0.3 to 1.0% there was an increase in bioactive compounds and FRAP values.During the storage of strawberry and sour cherry jam, changes occur which lead to a decrease in quality. Knowledge of these changes makes it possible both to predict the quality of these products and to assess the technology applied.There were considerable differences in the content of all the bioactive compounds investigated, both as a result of processing into jam and as an effect of storage at 20°C for 4 months.

Table 1. Changes in FRAP value and bioactive compound content in strawberry jam during storage

Sample	FRAP (mM Fe/100g s.u)	TPC (mM GAE/100 g d.s)	TMA (mg/100 g d.s)
1 day			
SJ-0.4P	25.75	11.21	**10.85**
SJ-0.7P	28.19	13.46	**12.71**
SJ-1.0P	31.78	15.51	**14.31**
2 months			
SJ-0.4P	22.87	9.24	**8.77**
SJ-0.7P	25.19	10.89	**10.59**
SJ-1.0P	28,04	12,93	**12.01**
4 months			
SJ-0.4P	18.83	7.86	**7.03**
SJ-0.7P	22.05	8.72	**8.16**
SJ-1.0P	**24.82**	**10.65**	**9.78**

Table 1. Changes in FRAP value and bioactive compound content in sour cherry jam during storage

Sample	FRAP (mM Fe/100g s.u)	TPC (mM GAE/100 g d.s)	TMA (mg/100 g d.s)
1 day			
SCJ-0.4P	40.12	38.12	**34.08**
SCJ-0.7P	43.61	40.58	**37.23**
SCJ-1.0P	47.13	42.26	**39.88**
2 months			
SCJ-0.4P	38.87	35.06	**32.75**
SCJ-0.7P	41.19	38.14	**35.07**
SCJ-1.0P	44.68	39.75	**37.22**
4 months			
SCJ-0.4P	34.66	29.63	**28,37**
SCJ-0.7P	36.93	33.52	**31.46**
SCJ-1.0P	**38.97**	**35.89**	**34.28**

CONCLUSIONS

Although some losses of the studied characteristics are observed, our data suggest that the jam obtained by thermal processing of strawberries and sour cherries still represents an important source of bioactive compounds. Through selective processing methods, the jams can preserve to a considerable extent the functional properties of the originating fruit. Knowledge of these changes makes it possible both to predict the functional quality of the jams produced and to assess the impact of the technology applied. Practical application of this work is that this information will be very useful in optimizing the jam processing technology and storage conditions, in order to improve their quality.