

ANTI OXIDANT EFFECT OF COLOR POTATO FLAKES IN COOKED PORK SAUSAGES

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Introduction

Recently it has been found that coloring pigments such as anthocyanin not only have a coloration function, but also shown antioxidant potential, thus, it leads to the reevaluation of anthocyanins effect on lipid oxidation. The color potatoes, which has both starch and anthocyanin attracted special interest due to their color appeal and their taste (Sorenson, 1992), are processed in to flakes (color potato flakes) due to their high moisture content. Studies on anthocyanin rich potato (*Solanum tuberosum* cv. *Shadow-Queen*) flakes showed antioxidant functions with regard to radical scavenging activity and inhibition of linoleic acid oxidation, further they improve the antioxidant potentials in rats (Han, et al, 2006). Thus, application of that antioxidant may be useful in controlling lipid oxidation, which is a major quality deteriorating factor in muscle foods. Further more, potato flakes have the advantage of being readily accepted by consumers, as they are considered natural. Therefore, in this study we added color potato flakes to cooked pork sausages, and examined the lipid oxidation during storage.

Materials and methods

Color potato flakes (CPF) of *shadow queen* were a kind gift from Somatch Center, House Foods Cooperation, Japan. The preparation of potato flakes was as follows: potatoes were thoroughly washed with water and air dried on filter paper, and then they were peeled and sliced. The sliced potatoes were treated with steam blanching to minimize the enzymatic reactions that bring out degrading anthocyanins. Next, they were mashed and dried in a drum dryer, and finally ground to flakes.

The effect of anthocyanins was evaluated on the oxidative stability of cooked pork sausages, during storage at 37° C, by measuring thiobarbituric acid reactive substances (TBA) values. The antioxidant levels of TBA values were compared to the negative and positive standard synthetic antioxidant; BHT as controls. The organoleptic assessment was performed by a sensory panel composed of 47 members by using paired test for color, flavor, taste and texture for cooked pork sausages. The significance of differences among different groups was determined by ANOVA with Duncan's multiple range test (SAS institute, Cary, NC, USA).

Results and discussion

We used purple sweet potato color (PSP) (San-Ei Gen F. F. I., Inc., Japan), which has similar anthocyanin chemical structure to color potato flakes for evaluate the degree of lipid oxidation; since we failed to separate the anthocyanin completely from CPF sample.

According to the Figure 1A, TBA value of the negative control (0%) reached the maximum value of 115 mmol/g on first day and maintain more or less similar value through out the storage period. In contrast, TBA

values of PSP showed similar tendency to positive control of synthetic antioxidant, BHT. Bar graphs prepared using 5 days data of different concentrations of PSP showed significantly low TBA value compared to negative control (Figure 1B). Five days TBA value of BHT 0.1% was closed to the TBA value of 0.2% PSP sample. We obtained the anthocynin concentration as 2.4 g/ 100 g PSP. According to the previous study (Han et al, 2006), the anthocynin concentration is 213.8 mg/ 100 g CPF. Therefore, obtained the same concentration of anthocynin we used 2% of CPF in meat samples.

We used different concentrations of CPF to evaluate the anthocynins activity in lipid oxidation (Figure 2). The order of the antioxidant ability is $0\% < 2\% < 50\% = 100\%$, and 2% CPF suppressed the lipid oxidation by 80% compared to the 0% CPF based on the 5 day results. We performed the sensory test, using pork cooked sausages with or without CPF. Among the tested characters, panelists accept all the characters of CPF added sausages except the color.

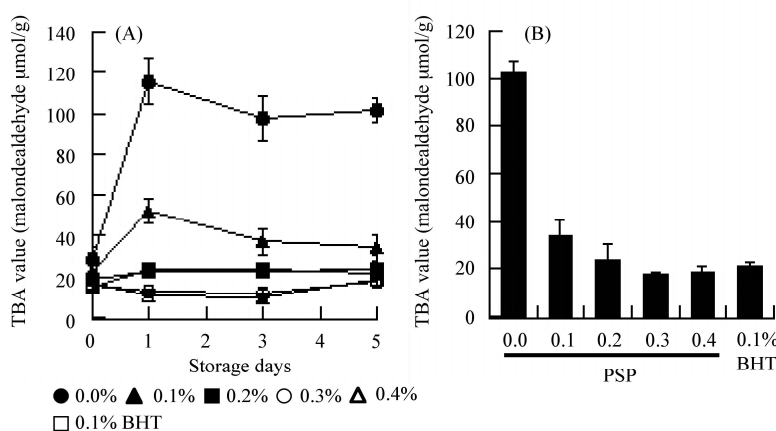


Figure 1. Changes in TBA content on cooked pork sausages including PSP during storage periods.

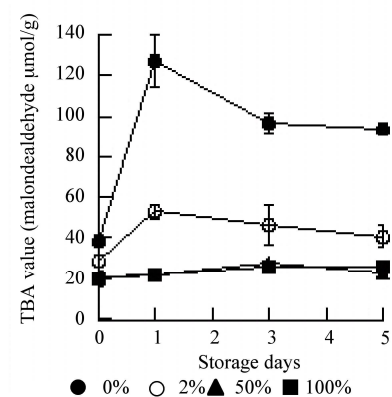


Figure 2. Changes in TBA content on cooked pork sausages including CPF during storage periods.

Conclusion

This study concluded that color potato flakes provide an antioxidant benefits to the cooked pork sausages stored at 37°C , which is comparable with the synthetic antioxidant BHA. Thus, as a natural food additives, could be used to extend the shelf life of meat products, may attract the consumers who preferred natural food additives than those of synthetic origin.

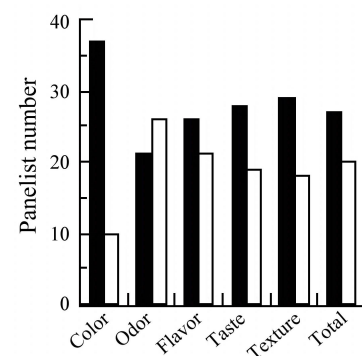


Figure 3. Sensory test by pair test method.

References

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