

ENHANCED REDDENING OF MEAT BY THE ADDITION OF HIMALAYAN ROCK SALT

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Abstract – This study was carried out to examine the reddening of meat products through the addition of natural yellow salt, (YS). Following YS or NaCl addition at 2% to pork subsequent to nitrite (0-100 ppm) treatment, color was analyzed both visually and spectrophotometrically. Assessment was also made of heme pigment content in meat. YS was found to bring about greater reddening compared to NaCl, thus indicating residual nitrite and nitrate content to be significantly higher, through the amount of either was quite small. The color forming ratio in meat was found to change by heme pigment content and the amount of nitrite required for red coloring was noted to vary significantly.

I. INTRODUCTION

Attention is increasingly being directed to food safety in response to consumer demand for this regard and accordingly, techniques for effectively enhancing red coloring using coloring agents as little as possible have thus become essential (1,2). Natural salts, particularly such as those found in

Himalayan salts appear to be promising candidates for reddening owing to their mineral content. To effectively bring about this coloring in meat products, examination was made of Himalayan rock salt for comparison with ordinary cooking salts.

II. MATERIALS AND METHODS

Meat taken from pig thigh was depleted as much as possible of its fat and connective tissue and then minced. To the meat samples, YS or NaCl was added at 2% along with 0.1% sodium ascorbate and sodium nitrite in the concentration range, 0, 10, 30, 50 or 100 ppm. The samples were then cooked at 75°C for 30 min after for 4 days storage at 4°C under anaerobic conditions. After sample cooling, color was assessed visually and then with a spectral colorimeter. The color forming ratio (CFR) (3) and heme pigment content were measured by acetone extraction. Residual nitrite and nitrate content were determined according to Mirna and Schütz (4) and by copper-cadmium column reduction, respectively.

III. RESULTS AND DISCUSSION

In the case of NaCl addition without nitrite, CFR was found to be less than that in YS samples and a^* (redness) was also less than that in other samples. In YS samples with and without nitrite, meat color was red and CFR was found to exceed 70% regardless of the low addition of nitrite in the range, 0 to 100 ppm (Fig.1).

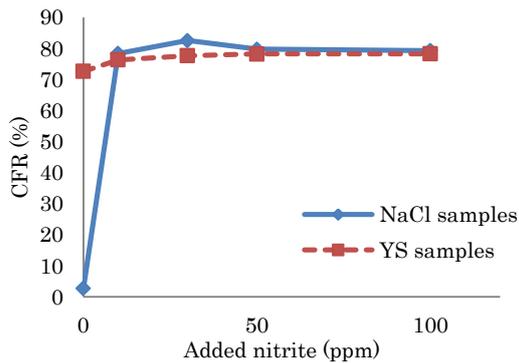


Fig.1. Color forming ratio (CFR).

Compared to NaCl samples, residual nitrite content tended to be higher in the case of YS addition (Fig.2), as also noted for nitrate included essentially in the rock salt. YS is thus shown to effectively enhance meat reddening. Small amounts of nitrite, nitrate and minerals may possible have contributed to this finding.

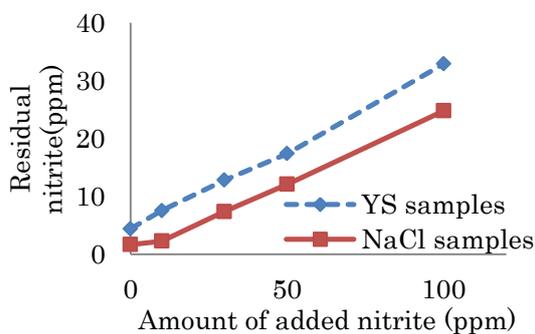


Fig. 2. Residual nitrite levels in samples.

CFR was seen to change with increase in heme pigment content in pork, in the case of YS addition. When the amount of this

pigment was quite small, the color ratio increased in the samples (Fig.3). The limited capacity of heme nitrosation for enhancing meat reddening may possibly be the reason for this.

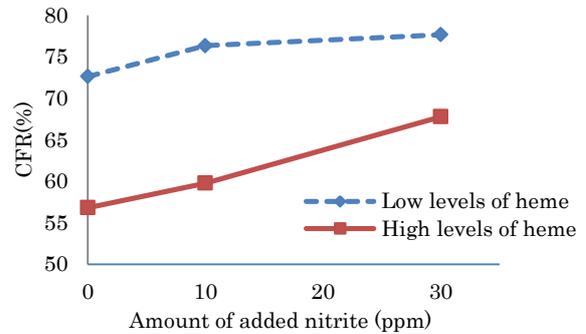


Fig.3. CFR as a function of heme pigment content.

IV. CONCLUSION

Using Himalayan rock salt, enhanced meat reddening was achieved at only very small nitrite content or even in its absence. The color forming ratio in cooked meat changed with heme pigment content in meat owing to the low degree of nitrosation in the meat.

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