STUDIES ON THE VOLATILE COMPONENTS OF FERMENTED CHINESE-STYLE SAUSAGE INOCULATED WITH LACTIC ACID BACTERIA DURING RIPENING

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Introduction

The utilization of lactic acid bacteria (LAB) in the processing of fermented sausage not only improves quality, enhance flavor and color (Hammes, 1990; Smith and Palumbo, 1983), but it can also inhibit the growth of undesirable bacteria and enterotoxins (Kato et al., 1990). Therefore, in the meat industry, LAB is widely used as starter culture for fermented meat products (Lücke, 1983). Chinese-style sausage is one of traditional meat products of China, where it is a popular food with a unique flavor. Chinese-style sausage differs from whesten-type fermented sausage in ingredients, manufacturing process, bacterial ecology, and flavor (Guo and Chen, 1991). Very few studies have been reported on the use of LAB in the production of Chinese-style sausage. There have been previous report that the use LAB in processing of Chinese-style sausage may contribute to improved quality of products (Huang and Lin, 1993; 1995), and the soluble nitrogen, nonprotein nitrogen and free amino acid of sausage are to increase with ripening time (Huang et al., 1998). The objective of this study was to investigate the volatile components of Chinese-style sausage inoculated with LAB during ripening.

Materials and Methods

The preparation of Chinese-style was according to Huang et al., (1998). The sausage dried at 45℃ in forced-air oven (Type-BT2, Chung-Chuan Co. Taiwan) at 75% RH for 6h, then was hung at 23±1℃ for 0,2,4 and 10 weeks to investigate volatile components. The *Lactobacillus plantarum* CCRC 12371 (FIRDI. Taiwan) and DS-66 (Rudolf Muller & CO., Germany) was used as starter culture for the production of the sausage. The volatile components of the sausage were extracted according to the method of likens-Nickerson (Romer and Renner, 1974), and were determined with the GC (Shimadzu GC-9A, Japan) and GC/MS (Hewlett-packard 5985 B GC/MS).

Results & Discussion

Use the LAB in processing of Chinese-style sausage exhibited higher level of volatile components then the fresh meat and no starter culture group, and to increase of volatile components with ripening time of sausage (Figure 1, 2 and 3). The important role of volatile flavor components was the active bacteria lipase of fermented sausage during ripening. The compounds of volatile components were aldehyde, alcohol, ester and heterocyclic compound. Furthermore, the more level content of volatile components were 2-heptenal, 2-heptanone, heptanal, O-Xylene, 2-n-Pentyl furan, Octanal, n-hexanal, butyl thiophene, n-nonylaldehyde, n-tetradecane, (E)-2-octenal, 1-octen-3-01(E.E)-2, 4-heptadienal, benzaldehyde, linalool, trans-caryophylone, (E)-2-deconal, acetophenone, estragole, 1-α-terpineol, endoborneol, (E)-2-undecenal, (E.E)-2, 4-decadienal, anethole, anisaldehy, 2-pentadecanone and 1-tetradecanol of sausage during ripening.

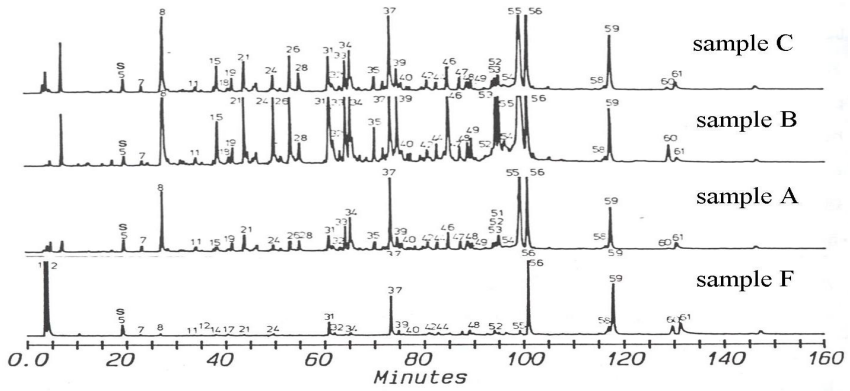

Figure1. Capillary gas chromatograms of volatile components of fresh meat and the Chinese-style sausage inoculated with lactic acid bacteria during ripening at 23±1℃ for 0 week.
Sample F: fresh meat, Sample A: No starter culture, Sample B: *L. plantarum*,
Sample C: DS-66, S: Standard (decane)

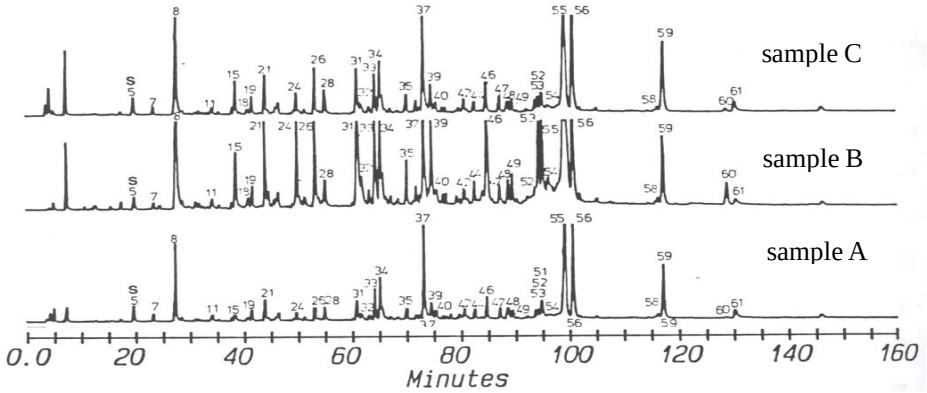

Figure2. Capillary gas chromatograms of volatile components of Chinese-style sausage inoculated with lactic acid bacteria during ripening at 23±1℃ for 2 weeks.
Sample A: No starter culture, Sample B: *L. plantarum*, Sample C: DS-66, S: Standard (decane)

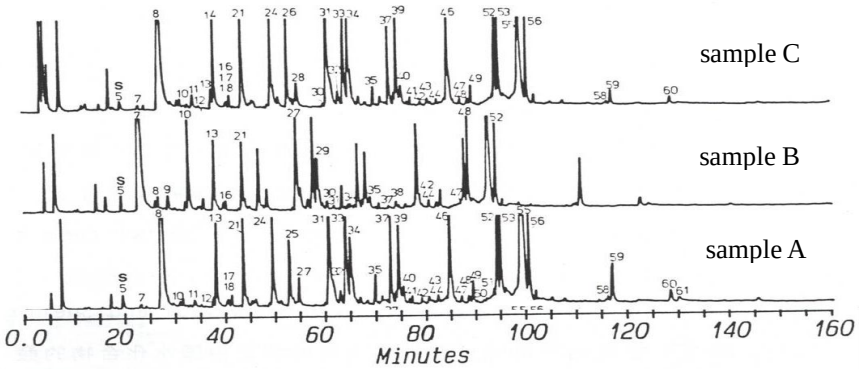

Figure3. Capillary gas chromatograms of volatile components of Chinese-style sausage inoculated with lactic acid bacteria during ripening at 23±1℃ for 10 weeks.
Sample A: No starter culture, Sample B: *L. plantarum*, Sample C: DS-66, S: Standard (decane)

Conclusions

Use the *L.plantarum* and DS-66 of LAB in processing of Chinese-style sausage exhibited higher level of volatile components then fresh meat and no starter culture of sausage. This can thus enhance to improve the flavor and quality of Chinese-style sausage during ripening.

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