

Quality characteristics, physical properties, and chemical composition of the traditional Chinese product “Pidan”

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Abstract

**[Aim]**

Pidan is a traditional Chinese preserved duck egg. Generally, pidan is made by coating the eggs with a pickling paste, which is a mixture of ash, clay, lime, and salt. Alternatively, eggs may be soaked in alkali media, salt, and Chinese tea and pickled for several weeks. We investigated quality characteristics, physical properties, chemical composition, and shell microstructure of pidan eggs obtained from four sources.

**[Methods]**

Four samples (A, B, C, and D) of commercial pidan duck eggs were studied. Samples A and B were products made in Taiwan and samples C and D in China. The weights of albumen, yolk, and eggshell were measured and respective ratios of each were calculated. We analyzed egg components in terms of pH, NaCl concentration, odor (by a smell distinction assay), moisture content, and textural properties of the egg albumen and yolk. In addition, eggshell surfaces were observed using a scanning electron microscope.

**[Results]**

The fat content of yolk in sample D was low (16.7 g/100 g) and rather less than that in sample A (23.6 g/100 g). The fatty acid composition of the yolk of sample D was distinct from that of the other samples. There were no differences in the weight component ratios of the four samples. The observed pH of albumen was 8.9–9.5 and was significantly higher in sample D. The observed pH of the yolk was 9.1–9.9 and was significantly higher in sample B. The color of the yolk was measured as low L\* and high a\* values for sample A. There were no differences in the NaCl concentration for the four samples. Odors recorded for sample A using the smell distinction device were different from those of the other samples. The “chewiness” of albumen in sample B was significantly high. Hardness indices were significantly high and cohesiveness of the yolk was low in sample C. The eggshell microstructure of sample C exhibited multiple holes and some cracking.

**[Conclusion]**

We concluded that sample C was affected by the differences in manufacturing methods.

皮蛋は中国で発達した家鴨卵の貯蔵加工品の一種である。皮蛋は通常灰、石灰と塩を混ぜたペースト状混合物で覆うか、食塩、紅茶やアルカリ物質を含む溶液に数週間浸漬して製品化される。我々は、4種類の皮蛋の品質特徴、物性、化学組成と微細構造について調査した。

試料は家鴨卵4種の市販皮蛋(A・B・C・D)を使用した。A、B試料は台湾製、C試料は中国製、D試料は香港製の製品である。各皮蛋における卵白・卵黄・卵殻の重量を計測し、部位別重量割合を求めた。卵白及び卵黄の成分分析・pH・色度・塩分濃度・におい識別装置によるにおいの測定、卵白の水分含有率・破断特性、卵黄のテクスチャーを測定し、組織構造を観察した。

4種の皮蛋の栄養価の特徴である、卵黄の脂質はAで多くDで少なく含まれていた。卵黄の脂肪酸組成はD試料が他の試料と異なった。重量割合では4種の皮蛋に有意差はみられなかった。pHは卵白で8.9~9.5となりD試料が有意に高く、卵黄で9.1~9.9となりB試料が有意に高かった。色度は卵黄でA試料のL\*値が低くa\*値が高い結果であった。塩分濃度は有意差がみられなかった。におい識別装置によるにおいの類似度では、A試料のにおいが他の試料と異なった。卵白の破断ではB試料が有意に高かった。卵黄のテクスチャーではC試料がかたさで有意に高く、凝集性で低い傾向がみられた。卵殻の組織構造の観察ではC試料の様相が異なった。

我々は、C試料が他の試料と異なった理由は製法の違いによる影響と考える。