



# Chinese ethnic meat products: Continuity and development



Weicai Zeng<sup>a,b</sup>, Wenting Wen<sup>a</sup>, Yue Deng<sup>a</sup>, Yuanyuan Tian<sup>a</sup>, Honghu Sun<sup>a</sup>, Qun Sun<sup>a,b,\*</sup>

<sup>a</sup> Key Laboratory of Bio-resources and Eco-environment of the Ministry of Education, College of Life Sciences, Sichuan University, Chengdu 610065, PR China

<sup>b</sup> College of Light Industry, Textile and Food Engineering, Sichuan University, Chengdu 610065, PR China

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## ABSTRACT

With their distinctive sensory characterizations and unique processing technologies, Chinese ethnic meat products possess great potential for development and continuity in modern China's meat industry. Due to the greater demand for meat products and higher quality and safety concerns in economically fast growing China, the development and continuity of ethnic meat products face its own unique challenges. In this review, the classification of typical ethnic products and their characteristics, and the research progress on their quality and processing technologies are discussed. The application of innovative and green technologies to improve the safety and quality of ethnic meat products for greater industrialization and sustainable development is highlighted. Furthermore, the strategy for promoting the production of Chinese ethnic meat products during the next five years is presented.

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## 1. Introduction

With more than 3000 years of history, Chinese ethnic meat products have been developed for their enhanced quality, flavor, and storage properties. The inimitable color, aroma, taste, and simulated shape of Chinese ethnic meat products enjoy a positive reputation and are regarded as the essence of human experience and wisdom (Xiong, Yang, & Lou, 1999). The sensory characteristics and cooking methods, as well as the varied processing technologies like salt-curing, sun-drying, and smoking, have been recorded in ancient Chinese literature such as “Li Ji” (Record of Rites) from the Zhou dynasty, “Shi Jing” (The Book of Songs) from the Han dynasty, and “Qi Min Yao Shu” (Important Arts for People's Welfare) from the Beiwei dynasty (Pang & Liu, 2012), and even Confucius accepted ten pieces of Chinese bacon as an apprentice gift according to the Analects of Confucius (Wang, 1993). The secrets of Chinese ethnic meat products and their innovative processing technologies have been gradually disclosed and exerted a great influence on food processing and cooking in Asia, as well as other parts of the world (Ho, 2004; Zhou & Zhao, 2007). Raw meat preparation and processing, cooking habits, and the organoleptic properties of Chinese ethnic meat products exhibit the deep connotation of Chinese foods of delectable, healthy, and cultural heritage (Guo, Huang, & Xue, 2005).

By evolving over thousands of years, Chinese ethnic meat products now show a strong viability for industrialization. Since the economic reform and opening-up to Western trade in China, the Chinese meat

industry has rapidly developed over the past three decades and made remarkable achievements to become the largest meat producer in the world since 2009, with 78.21 million tons of meat (28% of the world's total production) produced in the year of 2009 (Li, 2013). According to the State Statistical Bureau of China, the total meat production reached 87.07 million tons in 2014, an increase of 2.0% compared to the previous year, and the quantity per capita of meat products in China has increased to 62.43 kg, with an average increasing rate at 2.2% every year since 2002 (National Bureau of Statistics of the People's Republic of China, 2015). It is expected that the total meat production output in 2015 will reach 86 million tons (more than 60% is pork) with a value of 133.33 billion dollars and gross profit of 5.33 billion dollars (Yang, 2014). The largest global share of the Chinese meat industry comes from the fast growing western style meat products, as well as the industrialization of Chinese traditional and ethnic meat products, which comprises approximately 45% of the total types of Chinese meat products (Wang, Liu, et al., 2013; Wang, Meng, et al., 2013; Wang, Ren, Liu, Zhu, & Wang, 2013). For traditional meat products, more than 80% are processed from pork, with minor from beef, duck, rabbit, and game meat.

## 2. Typical Chinese ethnic meat products and their classification

With a vast territory of 9.6 million square kilometers and diversified 56 nationalities, the eating habits of Chinese vary greatly; Chinese ethnic meat products have gradually developed with the addition of elements from other regions and nationalities thereby forming various processing techniques and enjoyable flavors (Wang, Liu, et al., 2013). It is widely believed that the Ming and Qing dynasties are the major period for the formation of local traditional meat products in China. In the

\* Corresponding author at: Key Laboratory of Bio-resources and Eco-environment of the Ministry of Education, College of Life Sciences, Sichuan University, Chengdu 610065, PR China.

E-mail address: [qunsun@scu.edu.cn](mailto:qunsun@scu.edu.cn) (Q. Sun).

old days, most animals such as pigs and chickens could only be slaughtered during special festivals, especially in rural regions, thus the processing of traditional meat products was popular and many meat products such as Chinese bacon and sausage were served during special festivals like the Chinese New Year (Xu, 2008). Most of the traditional meat processing techniques in China apply scientific principles and present potential application in the modern meat industry (Wei, Zhao, & Yu, 2011).

### 2.1. Meat product classification based on the region of origin

Based on the region of origin and their flavor characterizations, Chinese ethnic meat products can be divided into four main categories, including North flavor, South flavor, Guang flavor, and Chuan flavor, which were formatted around the Beijing, Nanjing, Lingnan, and Chengdu areas, respectively, as shown in Fig. 1 (Pang & Liu, 2012; Zhu et al., 2013). This classification is more cultural. For each flavor category, there are numerous typical meat products found across the country shown partially in Fig. 2, such as Dried Salted Duck, Jinhua ham, Chinese bacon, sausage, and sauce pickled meat jerky, which possess unique flavors like “fresh and crisp, mellow”, “agreeable sweetness, refreshing, fresh and tender”, and “Ma, spicy, fresh, and Shannon”, respectively (Li, 2005).

#### 2.1.1. North flavor

It was formatted around the Beijing area and has the character of “fresh, crisp”. These types of meat products have been integrated with many other flavors, such as Muslim and Gong Ting (Palace) foods during the long period of its development. With its proud history, North flavor has gained a wide range of popularity in China and enjoys a high international reputation. Typical North flavor products include Peking Roasted Duck, Meat in Sauce, and Plain Boiled Pork. Processing of Peking

Roasted Duck requires special local force-fed ducks as raw material and a traditional closed stove, in which the ducks are hung over an open fire. Specifically, fruit trees are usually used as fuel to roast the ducks to give tender duck meat with a crispy golden skin of unique sweet and fragrant flavor. Being the North flavor representative, Peking Roasted Duck is frequently served in state banquets (Chen & Ockerman, 2012).

#### 2.1.2. South flavor

It originated from the Tang and Song dynasties and mainly contained four elements: Jinling, Huaiyang, Shuxi, and Xuhai flavors. It was formatted around the Nanjing and Suzhou areas and has been popular in the south regions for centuries. Typical South flavor meat products include Jinhua ham, Rugao ham, and Dried Salted Duck, and have mellow and agreeable sweet flavors. The shape of the products is another important characteristic for South flavor meats, e.g. Jinhua ham has to mimic the elegant shape of the Chinese traditional instrument the lute (Fig. 2B). Due to its exquisite properties, South flavor was once supplied as a tribute to kings, like Yongle emperor from the Ming Dynasty (Pang & Liu, 2012). The production of Jinhua hams has three main steps. The first is the curing period, during which the curing ingredients are rubbed onto the green ham surfaces at refrigerated temperatures. In the second phase, hams are hung in a smokehouse and subjected to cold smoking between 21 °C and 32 °C with the internal temperature usually being 5 °C lower than that in the smokehouse. Smoking lasts two to three days till the meat obtains a desirable amber or mahogany color. The third phase includes a long aging process of 6 to 9 months to allow the development of the full flavor profile of the hams (Yang & Liu, 2008). In sub-Yangtze China, ham is a must-have among traditional dishes, such as Yan Du Xian (where Yan means salted pork) and Da Ban Xiang (cured pink pork cubes that emit the alluring fragrance of camphor trees used for smoking) (Pang & Liu, 2012).

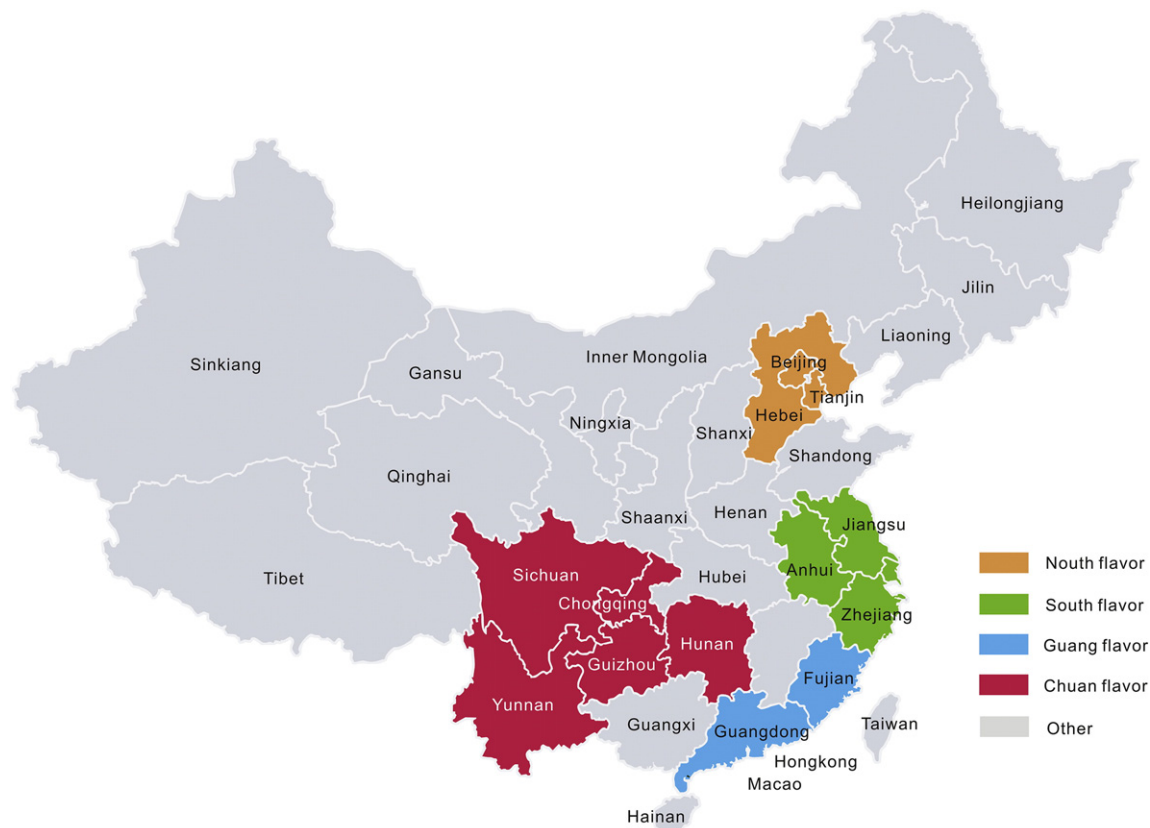


Fig. 1. The distribution of four main categories of Chinese ethnic meat products.

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