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Research Article

A Market Study for Dried Noodles in China: Current Situation and Trend in Supply

[1, 2]Rui Liu, [1]Yingquan Zhang, [1]Bo Zhang and [1]Yimin Wei
[1]Institute of Agro-Products Processing Science and Technology, Chinese Academy of Agriculture Sciences/Key Laboratory of Agro-Products Processing, Ministry of Agriculture, Beijing 100193,
[2]Hebei Jinshahe Institute of Food Industrial Technology (Beijing), Beijing 100081, P.R. China

Abstract: The aim was to study the current situation in the supply of dried noodles in China, analyzed regional disparity and trend of dried noodles markets and explored effects of variety and packaging on noodles price. Data were collected via the survey method in four representative cities in China, included Beijing, Hangzhou, Changsha and Hefei. Based on the quota sampling and simple random sampling methods, supermarkets and retail stores were selected. The brands, varieties, producers, origin, packaging style, net content and price of the dried noodles presented on the shelves were examined. No leading brand was observed in Beijing in 2010, while some brands showed distinct comparative advantages, with a large market share in 2012. Some traditional regional brands, such as “Kemen” and “Fengda”, had become nation-wide brands and hold a large proportion in many cities. As new brands from multinational enterprises, “Arawana” and “Jinmailang” were growing fast. The price of dried noodles showed some regional difference. Dried noodles in Beijing and Hangzhou, two developed cities of China, showed higher price than inland second-tier cities. The dried noodles price and the proportion of high-end products significantly increased from 2010 to 2012. Competition at high end of the noodles market was getting tougher than that at the low end. Both the variety and packaging type had significant effects on noodles price. Dried noodles targeted at children or with seasoning bags showed significantly higher price. The dried noodles with better package had a higher price.

Keywords: Brand share, China, dried noodles, market supply, packaging, product price

INTRODUCTION

Noodles as a traditional staple food enjoys great popularity in China and some Asian countries and are consumed worldwide. The importance of noodles in Asian diet is significant. Currently, an average of 20-50% of total wheat flour consumption in many countries occurs in the form of noodles (Hou, 2010). McKee (2009) noted that, with wide acceptance of noodles worldwide, the noodles product is one of a number of wheat-based foods whose globalization continues to stimulate international trade in the world’s top-ranked grains in terms of harvested area. Dried noodles manufactured by mechanized assembly line, have much higher commercial value than other noodle types (Liu *et al*., 2003). As at 2012, dried noodles output in China was recorded at 7.0 million tons and about 9.0-10.0 million tons of wheat was used for its production (Chinese Institute of Food Science and Technology, 2013). In the past five years, dried noodles industry has expanded sharply, the business gets bigger and more profitable, more also, the consumption of dried noodles increased significantly.

According to “2011 Chinese Dried Noodles Industry Development Report” released by Chinese Institute of Food Science and Technology (2012), Jinshahe Flour Manufacturing Co., Ltd. located in Hebei Province ranked 1st in China, with 28 million tons of noodles being produced in 2011. Kemen Noodles Manufacturing Co., Ltd. located in Hunan Province ranked the 2nd with the production of 19.26 million tons, followed by Hebei Yongsheng Food Co., Ltd., Zhengzhou Boda Flour Industry Co., Ltd. and China National Cereals, Oils and Foodstuffs Corporation Co., Ltd. Two types of dried noodles are mainly produced in China according to Chinese Industrial Standard SB/T 10068-92 and SB/T 10069-92 released by Ministry of Commerce classified them as namely “ordinary dried noodles” and “varied dried noodles”. The ordinary noodles are only made of wheat flour, water and salt (alkaline), while the varied noodles have other ingredients such as eggs, beans, corn, buckwheat, vegetables, milk and additives. At present, there are a great many brands and varieties of dried noodles in China market, the product price and physic-chemical qualities varies widely (Liu *et al*., 2012).

Corresponding Author: Yimin Wei, Institute of Agro-Products Processing Science and Technology, Chinese Academy of Agriculture Sciences/Key Laboratory of Agro-Products Processing, Ministry of Agriculture, Beijing 100193, P.R. China

Fig. 1: Distribution of surveyed four cities in China. The ● indicates the surveyed city

The effects of various flour component and processes on the quality of Chinese noodles had been studies widely (Liu *et al*., 2003; Fu, 2008; Ye *et al*., 2009; Zhang *et al*., 2011; Li *et al*., 2012). However, the current conditions and trend of China's dried noodles market, the biggest noodles market in the world are not clear yet. In this study, in light of the dried noodles supply condition of major cities across China, the authors analyzed regional disparity and trend of dried noodles industry and explored the factors affecting products pricing. Two market surveys were carried out in Beijing in October 2012 and January 2010 respectively and the noodles markets of Hangzhou city in Zhejiang Province, Changsha city in Hunan Province and Hefei city in Anhui Province were investigated in 2012 (Fig. 1), with the aim to learn about the situation and change of brand, market share of main brands, variety, product packaging and price of dried noodles and effects of variety and packaging on noodles price. This study can provide dried noodles manufacturers and distributors with up-to-date information for design of new products, positioning of the various products and improvement of market share.

MATERIALS AND METHODS

Basic information and process of investigation: According to the presentations from "The 13th China's Flour Product Convention" organized by Chinese Institute of Food Science and Technology and the communication between the authors and other participants in this conference, included officials, entrepreneurs and scientists, four representative cities in China with high consumption and crowed market in dried noodles were selected as surveyed areas, include Beijing, the capital of People's Republic of China, Hangzhou, the capital of Zhejiang Province, Changsha, the capital of Hunan province and Hefei, the capital of Anhui Province. Two market surveys were carried out in Beijing in October 2012 and January 2010, respectively. This include 108 large-and medium-sized chained supermarkets in the urban districts and suburban counties of Beijing selected in 2012 and 50

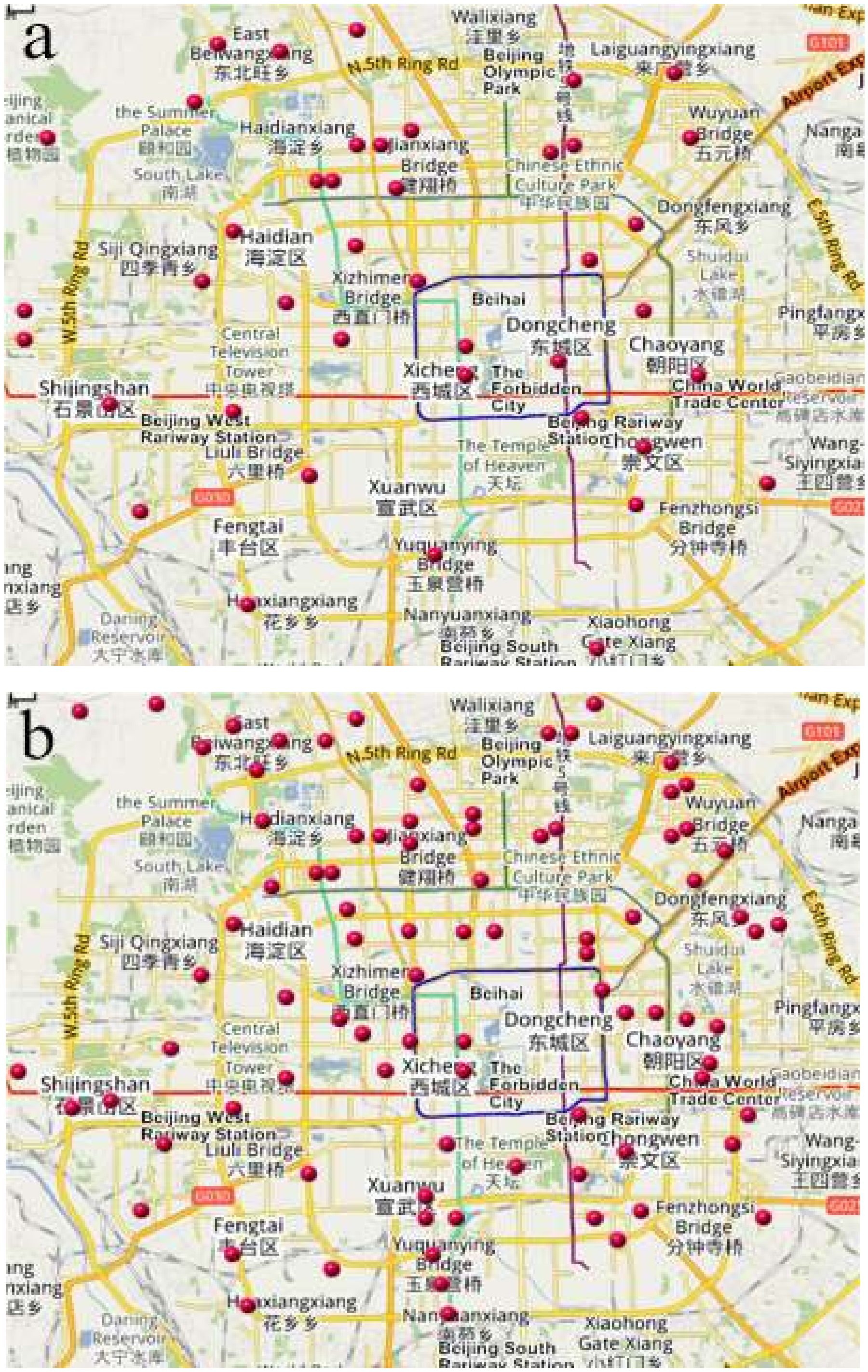

Fig. 2: Distribution of surveyed supermarkets in downtown Beijing: (a) 2010, (b) 2012. The ● indicates the surveyed supermarket

supermarkets in 2010 (Fig. 2), based on the quota sampling and simple random sampling methods. The supermarkets are distributed across eight different districts in Beijing. They are Dongcheng, Xicheng, Haidian, Chaoyang, Shijingshan, Fengtai, Changping and Huairou under the jurisdiction of Beijing city. The supermarkets where the surveys were carried out include foreign chains such as Carrefour, Wal-Mart, France's Auchan, Britain's Tesco, Germany's Metro Group, South Korea's Lotte Mart and Japan's Yokado and domestic retailer such as Wumart, Vanguard, Century-mart, BHG, Merry mart and Chaoshifa Supermarket.

In May to November 2012, 71, 46 and 38 supermarkets and retail stores in Hangzhou, Changsha and Hefei were examined, respectively.

Table 1: Top 10 dried noodles brands for market coverage and shelf share in 2010 Beijing

Rank	Brand	Market coverage (%)	Rank	Brand	Shelf share (%)
1	Kemen	84.0	1	Fengda	15.9
2	Fengda	76.0	2	Kemen	9.0
3	Biomate	74.0	3	Ruonan	7.5
4	Xiangxue	46.0	4	Biomate	6.7
4	Maitiancun	46.0	5	Xiangxue	4.5
6	Wangjia	44.0	6	Jinjian	3.6
6	Weidu	44.0	7	Wangjia	3.5
8	Junen	42.0	8	Junen	3.4
9	Jinjian	38.0	9	Chunhui	3.1
10	Ruonan	36.0	10	Jvefoo	3.0
10	Boda	36.0	10	Savorily life	3.0

Table 2: Top 10 dried noodles brands for market coverage and shelf share in 2012 Beijing

Rank	Brand	Market coverage (%)	Rank	Brand	Shelf share (%)
1	Kemen	93.5	1	Kemen	22.8
2	Fengda	81.5	2	Fengda	16.9
3	Biomate	74.1	3	Arawana	5.2
4	Arawana	55.6	4	Biomate	5.0
5	Xiangxue	46.3	5	Xiangxue	4.3
6	Jinmailang	41.7	6	Savorily life	3.4
7	Boda	38.0	7	Jinshahe	2.9
8	Junen	35.2	8	Jinmailang	2.9
9	Saibeixue	34.3	9	Chunhui	2.7
10	Chunhui	33.3	10	Boda	2.3
10	Jvefoo	33.3			

The brands, varieties, producers, origin, packaging style, net content and price of the dried noodles presented on the shelves in the selected shops were investigated.

Brand evaluation method: The market share of dried noodles brands was evaluated based on market coverage rate and shelf share. Market coverage rate = Brand frequency/Number of investigated shops×100%. Brand frequency is the number of shops selling a specific dried noodles brand. Shelf share was used because shelf share can accurately state how much proportion of the shelf area taking by one brand in a shop. And also estimate how much area acquired the competition. Shelf share also help to compare the maintenance of the positions during a period of time. Shelf share is the percentage of the shelf number of a specific dried noodles brand in the total dried noodles shelf number in the investigated shops.

Statistical analysis: The data obtained in this study were expressed as means of at least three replicated determinations. One-way analysis of variance was used to analyze the data and significant differences among means were compared by the LSD test using SPSS ver. 16.0 for Windows. Differences were considered significant at $p<0.05$.

RESULTS AND DISCUSSION

Dried noodles brands: There were approximately 69 brands, 450 kinds of dried noodles in Beijing market in 2010, while the number of dried noodles brands increased to 94 in 2012. With the rapid development of dried noodles industry, the bright market prospects of dried noodles attracted many companies to invest this. Many flour and instant noodle enterprises entered the dried noodles industry, including some multinational corporations, such as Wilmar International Limited, Uni-President Enterprise Corporations, Nissan Jinmailang Foods Co. Ltd. and Hebei Wudeli Flour Mill Group Corporations.

The dried noodles brand of "Kemen" produced by Kemen Noodles Manufacturing Corporation in Hunan Province enjoyed the highest rate of market coverage in 2010 in Beijing market, "Fengda" brand produced by Hefei Fengda Group Co., Ltd. in Anhui Province ranked 2nd, "Biomate" brand manufactured by Qingdao Biomate Foodstuff Co., Ltd. got the 3rd rank, followed by "Xiangxue", "Maitiancun", "Wangjia", "Weidu" and so on (Table 1). With regard to shelf share in 2010, "Fengda" ranked 1st, "Kemen" and "Ruonan" ranked the 2nd and 3rd and "Biomate", "Xiangxue", "Jinjian" were among the top six (Table 1). After two years of development, rankings of dried noodles brand for market coverage and shelf share in Beijing market had changed. Table 2 showed that "Kemen" still ranked 1st for market coverage in 2012 and "Fengda", "Biomate", "Xiangxue" continue to top 5. However, the brands of "Maitiancun", "Weidu" and "Jinjian" failed to make the top 10 in 2012 (ranking 18th, 13th and 20th, respectively) and "Ruonan" brand didn't squeeze into the top 20. "Arawana" brand comes from Yihai Kerry funded by Wilmar International Limited and "Jinmailang" producers had moved into the top 6 as two new brands. As for Shelf share, "Arawana", "Jinmailang" and "Jinshahe" moved into the top 8, while "Ruonan", "Jinjian", "Wangjia", "Junen" and "Jvefoo" failed to make the top 10 in 2012. Based on the results obtained from these two surveys, there were no leading brands in Beijing market during 2010. But in 2012, some national brands, such as "Kemen", "Fengda", "Biomate",

Fig. 3: The main national brands of dried noodles in China market; (a): Kemen; (b): Fengda; (c): Xiangxue; (d): Jinshahe; (e): Jinjian; (f): Biomate; (g): Junen; (h): Arawana; (i): Jinmailang

"Arawana" and "Xiangxue", had accounted for a large market share. With the maturity of the Chinese noodles market, the brand competition would be the major theme of the market. High-brand superiority of some noodles production enterprise, especially Wilmar International Limited, is continuously increasing.

Compared to Beijing market, fewer brands were observed in the other 3 cities, with 58, 19 and 32 brands in Hangzhou, Changsha and Hefei, respectively. No leading dried noodles brands were outstanding in Hangzhou and product brands showed obviously difference among different chain supermarkets and stores. The market coverage of the brands of "Junen", "Jinmailang" and "Juxiang" which were the topped 3 in Hangzhou, were only 20, 18 and 16%, respectively. In regard to shelf share, "Jinshahe" (11%) ranked 1st and "Kemen" (10%) and "Jinmailang" (7%) topped 3.

According investigation results in Changsha city, the brand of "Kemen" produced by Kemen Noodles Manufacturing Corporation in Hunan Province was the leading brand in Changsha, with market coverage of 96% and shelf share of around 50%. In addition, "Jinjian" and "Yuxiang" both also shared the relatively large share in Changsha market with market coverage of around 80%, indicating they are popular and have certain consuming groups.

As in Changsha, there also was a leading and traditional brand in Hefei market, namely "Fengda", with market coverage of 90% and shelf share of 34%. The Hefei survey results also showed that "Jinshahe" (71%) and "Boda" (39%) were ranked the 2nd and 3rd for market coverage and "Jinshahe" (12%) and "Kemen" (10%) were ranked the 2nd and 3rd for shelf share, respectively.

"Fengda" of Hefei Fengda Group Co. Ltd. and "Kemen" of Hunan Kemen Noodles Manufacturing Co., Ltd. showed unique home-field advantage in Hefei city and Changsha city, respectively. As result of more brands and absence of leading brands, competition on dried noodles markets was more intense in Beijing and Hangzhou markets than that of Changsha and Hefei.

The results of five surveys showed that brand ranking differed from one city to another, but the top brands were similar. Some traditional brands, including "Kemen", "Fengda", "Jinshahe", "Xiangxue", "Jinjian" and "Junen" entered relatively earlier the Chinese dried noodles market, had become nation-wide brands and hold a relatively large proportion in many cities by superiorities in location, resources and policies. As new dried noodles brands emerged in 2012, "Arawana" had occupied a certain market share in Beijing based on analysis on market coverage and shelf share and "Jinmailang" also hold a relatively large share in Beijing and Hangzhou markets. These brands were shown in Fig. 3. As more conglomerates enter the Chinese market of dried noodles, the situation could change to some extent. These corporations may obtain a favorable position in the fierce market competition with their ample capital, advanced management, excellent sales and professional Research and Development team. This will create great pressure on the traditional dried noodles producer.

Product price of dried noodles: The price range of dried noodles products investigated in 2010 in Beijing market was from RMB¥ 1.86/500 g to RMB¥ 12.33/500 g and the average price of dried noodles was RMB¥ 4.01/500 g. 43.37% of dried noodles price was concentrated in the range of RMB¥ 3.00~4.00/500 g, on the other hand 22.70% was within a range of RMB¥ 4.00~5.00/500 g, 17.08% was under RMB¥ 3.00/500 g and 7.19% was over RMB¥ 6.00/500 g.

Table 3: Product price of each kind of dried noodles

Variety	2010 Beijing	2012 Beijing	Hangzhou	Changsha	Hefei
White salted noodles	3.9±1.42d	5.1±3.10d	4.7±2.97d	4.1±0.84d	3.7±0.71d
Egg noodles	4.0±2.21d	4.7±1.38e	4.5±1.24d	4.2±1.03d	3.7±0.98d
Mixed grains or vegetables noodles	4.9±1.80c	5.7±3.32c	5.6±3.77c	5.4±0.84c	4.8±0.82c
Noodles targeted at children	14.7±13.15a	13.9±6.20a	15.4±8.21a	8.1±1.45b	11.5±4.89a
Noodles with seasoning bags	8.5±1.66b	9.6±2.18b	10.5±3.69b	9.6±2.18a	9.4±1.77b

Different letters within columns are significantly different at $p<0.05$ level

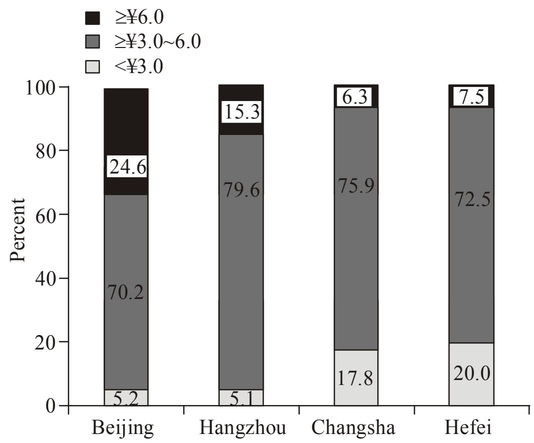

Fig. 4: Product price distribution of dried noodles in different Chinese cities

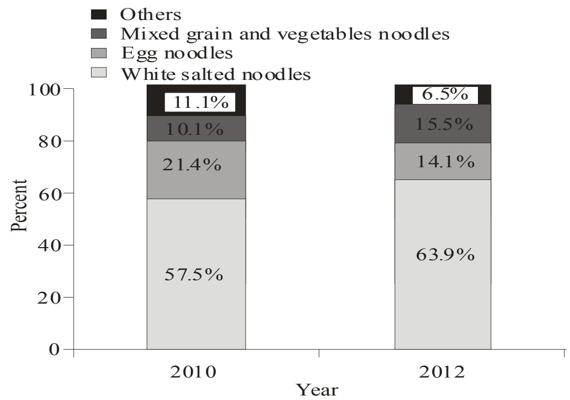

Fig. 5: Percentage of all kinds of dried noodles products in Beijing market

The results showed that dried noodles were cheap and high-end dried noodles products were rare in 2010.

The product price of dried noodles investigated in Beijing market in 2012 was from RMB¥ 1.99/500 g to RMB¥ 74.00/500 g and the average price was RMB¥ 5.81/500 g. 52.0% of dried noodles price were concentrated in the range of RMB¥ 4.00~6.00/500 g, 24.6% of dried noodles price were over RMB¥ 6.00/500 g and only 5.2% were under RMB¥ 3.00/500 g. When compared to 2010 results, the dried noodles price increased significantly and the proportion of high-end products significantly increased. In the last 2 years, the average price of dried noodles samples rose from RMB¥ 4.00/500g in 2010 to RMB¥ 5.81/500 g and the proportion of dried noodles products with high price (≥¥ 6.00/500 g) had increased by 17.4%. This phenomenon indicated that the competition at the high-end of the market will be more chilling than that at the low-end in future.

There was some regional difference in the dried noodles price in 2012. The results showed that the highest average price of dried noodles was in Beijing with ¥ 5.81/500 g, followed by Hangzhou city with ¥ 4.94/500 g and average prices in Changsha (¥ 4.09/500 g) and Hefei (¥ 3.96/500 g) were the lowest. In Fig. 4, medium price noodles in equal proportions in the different surveyed cities, around 75% of noodles were at a fixed price range of ¥ 3~6/500 g. The percentage of low price (<¥ 3.0/500 g) noodles in Beijing and Hangzhou were lower than that of Changsha and Hefei obviously, while the percentage of high price (≥¥ 6.0/500 g) noodles were relatively higher. It indicated that dried noodles in Beijing market showed the highest product price, followed by Hangzhou city; while Changsha and Hefei markets showed relatively lower noodles price. Dried noodles price was mainly affected by the economic development of the cities, the consumption level and consumption ideology of the citizens with significant difference among the cities. Beijing, the capital of China, is China's political, cultural and international exchange center. Hangzhou, capital of the eastern province of Zhejiang, has a per-capita GDP of RMB¥ 780 998 million, the 10th largest among China's cities. Therefore, the dried noodles products in these 2 better developed cities showed higher price than Changsha and Hefei which both are second-tier cities in China.

Products category and packaging of dried noodles in Beijing market: According to China's Ministry of Commerce grouped the dried noodles into two categories: the ordinary dried noodles and varied dried noodles. The ordinary dried noodles included white salted noodles, yellow alkaline noodles and *La-Mian* noodles, while the varied dried noodles included egg noodles, mixed grains or vegetables noodles, micronutrient fortified noodles, mixed Chinese herbs noodles and so on. The Beijing survey showed that white salted noodles was the most common type among surveyed dried noodles having a percentage of 57.5% in 2010 and 63.9% in 2012, followed by egg noodles, mixed grains or vegetables noodles as shown in Fig. 5. The proportion of egg noodles decreased significantly

Table 4: Product price of dried noodles with different packaging

Packaging style	2010 Beijing	2012 Beijing
Cylindrical paper package	3.4±1.32c	4.8±1.10d
Plastic bags package, bulk inside	4.5±2.21b	5.2±2.81c
Plastic bags package, containing bundles	4.5±1.94b	7.6±5.73b
Boxes package	7.1±2.09a	14.3±7.09a

Different letters within columns are significantly different at $p<0.05$ level

(a) (b)

(c) (d)

Fig. 6: Four kinds of packaging types of dried noodles products in China; (a): Cylindrical paper package; (b): Plastic bags, bulk inside; (c): Plastic bags, containing some bundles; (d): Boxes package

from 2010 to 2012, while the proportion of mixed grains or vegetables noodles increased by 5.4%. Many Chinese consumers increasingly concern about healthful eating, so mixed grain noodles and vegetable noodles are becoming increasingly popular (Liu *et al*., 2013). According to target consumer groups, dried noodles products can be divided into two categories: dried noodles for children and dried noodles for adults. Dried noodles targeted at children only accounted for 5.8% in 2010 and 6.5% in 2012 respectively. Dried noodles products can also be categorized into other two types: those with seasoning bags and those without seasoning bags. The products with seasoning bags only accounted for 1.9% in 2010 and 0.9% in 2012, respectively.

There are four major kinds of packaging types in Chinese market, namely "cylindrical paper package", "plastic bags package, bulk inside", "plastic bags package, containing some bundles" and "boxes package" (Fig. 6). "Cylindrical paper package" is traditional packaging style for dried Chinese noodles and is made manually by workers by folding the paper around the noodles and using edible glue for fixing. Results from Fig. 7 shows that, "cylindrical paper package" was the main packaging type, which accounted for over 50% of the total number of dried noodles in the two surveys carried out in Beijing. This

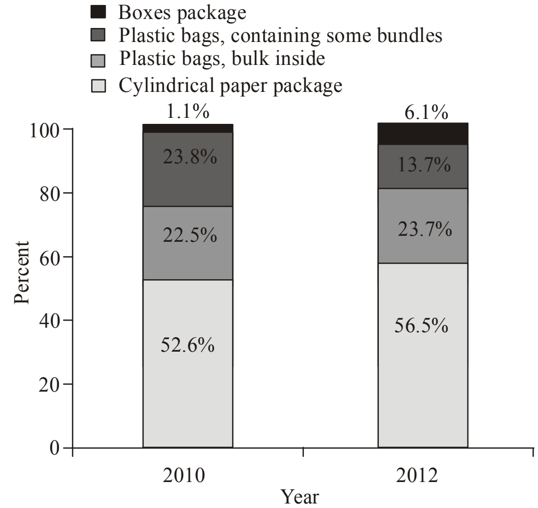

Fig. 7: Percentage of different packaging types of dried noodles in Beijing market

result is in line with preliminary consumer survey conducted in Beijing, where around 60% of the respondents preferred "cylindrical paper package" (Liu *et al*., 2013). The proportion of boxed dried noodles increased significantly, while that of "plastic bags package, containing some bundles" decreased by 10.1%.

Effects of product variety and packaging on noodles price: Variance analysis showed the variety had significant effects on price (Table 3). The five surveys except for Changsha survey all showed that dried noodles targeted at children had the highest price, followed by seasoning noodles. The price of white salted noodles and egg noodles were significantly lower than other noodles and no significant difference in price between White salted noodles and egg noodles was observed. When compared to 2010 Beijing, the product price of each kind of dried noodles had increased in 2012 except for noodles for children, especially the white salted noodles.

The packaging had significant effect on price and the dried noodles with better package had higher price (Table 4). The 2010 Beijing survey showed that the price of dried noodles in boxes was found to be highest, with an average of RMB¥ 7.12/500 g; while dried noodles with cylindrical paper package recorded lowest, with an average less than RMB¥ 4.00/500 g. The price of boxed dried noodles was significantly higher than that of the products wrapped in cylindrical paper and plastic bags. The plastic bagged dried noodles were more expensive than dried noodles with cylindrical paper package. The results from 2012 Beijing survey agrees with that of 2010 survey, where the trend of dried noodles price is that "boxes package">"plastic bags package, containing some bundles">"plastic bags package, bulk inside">"cylindrical paper package". The results also showed that product price of dried noodles with each packaging type had all remarkably increased from 2010 to 2012.

Packaging elements in explaining market price differences for food played an important role (Loose and Szolnoki, 2012). Becker *et al*. (2011) noted that consumers unconsciously use symbolic information connoted by packaging features to draw inferences about the product content. A full-information and well-designed noodles package can attract consumers and make it stand out from competitive products. Therefore, development of varied noodles and improvement of product packaging would help to raise the dried noodles price, generate more profits and attract more consumers, especially the new generation.

CONCLUSION

There were no leading dried noodles brands in theet in 2010. But in 2012, some brands showed relatively high market coverage and shelf share, and high-brand superiority from some noodle producers is on the increase. No leading brand was observed in Hangzhou market, while "Fengda" and "Kemen" showed unique home-field advantage and were strong brands in Hefei and Changsha, respectively. Some traditional regional brands, such as "Kemen", "Fengda", "Jinshahe" and "Xiangxue", had become nation-wide brands and hold a relatively large proportion in many cities. As new brands from multinational enterprises, "Arawana" and "Jinmailang" developed rapidly. The market competition goes more and more fierce.

There was some regional difference in the dried noodles price. Dried noodles in Beijing market were sold at the highest price, followed by Hangzhou; while Changsha and Hefei which both are inland secondtier cities showed relatively lower noodles price. Dried noodles in Beijing and Hangzhou, two developed cities of China, showed higher price than inland second-tier cities. The dried noodles price and the proportion of high-end products significantly increased from 2010 to 2012 in Beijing. Competition at medium and high end of the noodles market is getting tougher than at the low end.

The white salted noodles were the most popular dried noodles variety, followed by egg noodles, mixed grains or vegetables noodles. "Cylindrical paper package" was the main packaging style of the dried noodles; and the proportion of "box package" increased significantly from 2010 to 2012. The variety and packaging type both had significant effects on dried noodles price. Dried noodles targeted at children or with seasoning bags showed significantly higher price than other dried noodles products. The dried noodles with better package had a higher price.

At present, more noodles production enterprises are trying to make the products diverse and they are also trying to improve the products quality in order to create well-known brands. Dried noodles belongs to public consumption hence, the nutrition, taste and price of dried noodle were the main factors influencing the purchasing decisions of consumers (Liu *et al*., 2013), dried noodles manufacturers should pay more attention on product price stability and also improve the noodles quality to become more competitive in order to gain larger market share. In addition, large enterprises should make great efforts to build their own research and development capacity. For example, developing different series of products to meet demands of various consumer groups, increase profits and raise social influence of the brands.

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