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COMMITTEE ON COMMODITY PROBLEMS

JOINT MEETING OF THE FOURTH SESSION OF THE SUB-GROUP ON BANANAS AND THE FIFTH SESSION OF THE SUB-GROUP ON TROPICAL FRUITS

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DEMAND RESPONSES TO PRICES, INCOME AND OTHER FACTORS IN THE CHINESE BANANA AND SELECTED TROPICAL FRUITS MARKETS

I. INTRODUCTION

1. China has become an important destination for bananas and several major tropical fruits, because of the steady and rapid economic growth over the past few decades. However, despite the increase in imports, per capita consumption of bananas and tropical fruits in China is still considerably lower than the world average. For instance, per capita consumption of bananas is around 6 Kg., which is roughly 30 percent lower than the world average and only 30 percent of the level of consumption in the United States. As domestic supply of tropical fruits is constrained by land availability, China would have to increase imports to meet its increasing domestic demand in the future. This document has been prepared in response to the Sub-Group's request for an analysis of the Chinese banana and tropical fruit markets to better understand the factors underpinning demand in these markets. Some of the results of the quantitative analysis had to be re-checked, but the revision was not completed in time to meet the strict deadline for translation of this document. Therefore, additional results and their policy implications will be presented as a CRS document at the joint-meeting in December.

II. DEVELOPMENTS IN CHINESE BANANA AND TROPICAL FRUITS MARKETS

2. The major producing areas for tropical fruits in China include Hainan, Guangdong, Guangxi, Yunnan, Fujian and the southern parts of Sichuan and Guizhou

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provinces. In 2007, the output of tropical and subtropical fruit was 13 million tonnes, with bananas accounting for about 70 percent, lychees about 15 percent, and mangos and pineapples about 7 percent. The Chinese fruit value chain is fully competitive and consists of farm-gate market, wholesale market, supermarket, fruit or grocery stores, private peddlers. Since the mid-1980s, fruit markets in China were completely liberalized, and growers could sell their fruit anywhere in the country or even export.

3. Official statistics of bananas and tropical fruits consumption are not readily available, either at national or household levels. Therefore, consumption was estimated by adding output and net imports (Table 1). These estimates indicate that the annual consumption growth rates of bananas, mangos, pineapples and lychees from 2001 to 2008 were 5.14 percent, 8.08 percent, 0.64 percent, and 8.49 percent, respectively. Per capita consumption, also increased rapidly from 2001 to 2008 except for pineapples, which remained relatively stable (Table 2).

Table 1. the Chinese tropical fruit consumption from 2001 to 2008 ('000 tonnes)

	banana	mango	pineapple	lyches
2001	587.7	47.7	86.9	94.6
2002	611.7	55.0	82.6	150.8
2003	652.7	62.9	81.5	110.4
2004	660.4	74.5	80.2	153.2
2005	672.2	76.5	84.4	141.6
2006	741.8	81.2	89.1	148.2
2007	810.8	77.1	91.0	168.3
2008	834.7	82.2	90.9	167.4

Source: author's¹ estimates.

III. FACTORS AFFECTING DEMAND

4. Factors underpinning the rapid growth of demand for tropical fruits in China include household incomes and prices. From 2001 to 2008, the annual growth rates of urban and rural household incomes were 10.48 percent and 8.32 percent, respectively. The rapid increases in income levels had a significantly positive impact on the growth in consumption of bananas and tropical fruits, as reflected in Table 2. During this period the coefficient between fruit consumption and household income was very significant at 0.78. However, there was a clear distinction between rural and urban incomes and the impact this had on their respective consumption levels. The income level of the rural household was about one-third of the urban household and their fruit consumption was only 32 percent of that of the urban household.

5. Apples and citrus are the most consumed fruits in China and together accounted for nearly half of the country's fruit consumption in 2007. Consumption of bananas and tropical fruits, although increasing steadily, per capita consumption is still low compared

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to the world average. Annual per capita consumption of bananas was 6.28 Kg in 2008 compared to the world average of 9.3 Kg. Per capita consumption of pineapples and mangos was 0.68 Kg and 0.62 Kg, respectively; far below the world average of 2.52 Kg and 6 Kg, respectively. Per capita consumption of lychees in China was 1.26 Kg in 2008 and is mainly consumed in the fresh, rather than processed form. Fresh and dried lychees account for more than 95 percent of the lychees consumed in China, but only 2 percent of per capita consumption of all fruits.

Table 2. Per capita income and fruit consumption

		2001	2002	2003	2004	2005	2006	2007	2008
Urban Households									
Disposable Income (RMB yuan)		6860	7703	8472	9422	10493	11760	13786	15781
Fruit Consumption (kg)		50.88	56.52	57.79	56.45	56.69	60.17	59.54	-
Rural Households									
Net Income (RMB yuan)		2366	2476	2622	2936	3255	3587	4140	4761
Fruit Consumption(kg)		20.33	18.77	17.54	16.97	17.18	19.09	19.43	-
Per capita consumption (kg)*									
banana		4.6	4.76	5.05	5.08	5.14	5.64	6.14	6.28
mango		0.37	0.43	0.49	0.57	0.58	0.62	0.58	0.62
pineapple		0.68	0.64	0.63	0.62	0.65	0.68	0.69	0.68
lyches		0.74	1.17	0.85	1.18	1.08	1.13	1.27	1.26

Source: SSB, *China Statistical Yearbook*, various years, Chinese Statistical Press.

* Data is estimated by the author.

IV. PRICE DEVELOPMENT

6. Price development will have a significant impact on demand if consumers are sensitive to price changes. Over the past few years, the retail prices of bananas, pineapples and several other tropical fruits have been in an upward trend. For instance, the average banana price in 2008 was Rmb 3.43/kg, which was 24 percent higher than in 2001. The price of pineapples was about 45 percent higher, from Rmb 2.18 to 3.17/kg, while the price of mangos dropped more than 47 percent, from Rmb 19.21/kg in 2001 to Rmb 10.11/kg in 2008. The sharp decline in the mango price was largely due to the increase in lower priced imports, which in turn drove domestic prices down. Mango imports grew at a significantly high growth rate of 27 percent between 2001 and 2008, from 14 470 tonnes to 611 000 tonnes.

V. FIELD SURVEY DATA

7. Given that no banana and tropical fruits consumption data were readily available a field survey was undertaken in six regions, including Beijing, Guangdong, Fujian, Shanghai, Shandong and Chongqin. A total of 450 questionnaires were handed out from which 312 valid copies were collected, including 278 urban households and 34 rural households. Questionnaires covered basic information on households, daily expenditure, fruit expenditure, fruit consumption, fruit price, purchasing location etc.

8. The results of the survey suggested that education, often used as a proxy for the ability to acquire information, was insignificant in affecting demand, which may imply that the nutrition value of fresh fruits was already well known in China. The parameter of purchasing location was insignificant too, which might suggest that consumers have access to tropical fruits markets, at least in the regions covered by the field study. According to the results, the location of the household had a significant role in determining banana and mango consumption, indicating income disparity between urban and rural income levels, with urban households consuming more than rural households.

9. Based on the estimated results, the income elasticity for bananas, mangos and lychees were computed. The income elasticity was 0.318 for mangos, 0.189 for bananas and 0.171 for lychees. All were positive but less than unit, which suggest that demand for bananas, mangos and lychees respond positively to changes in income but was not relatively sensitive. A 10 percent change in income induced a 2 to 3 percent change in demand. These findings are consistent with many previous studies, which identified inelastic demand response to income because fruit consumption is considered a *necessity* for the household.

10. Given the nature of the survey data, it may be impossible to estimate price elasticities. An additional effort is needed to estimate a time series data based on national aggregates, which will be used to estimate all price elasticities of bananas and selected tropical fruits. These results will be reported in CRS at the December meeting.

VI. POLICY IMPLICATIONS AND DISCUSSIONS

11. Domestic demand for banana and tropical fruits in China has been steadily increasing due to rising incomes, population growth, urbanization and increased health consciousness. However, per capita consumption of tropical fruit remains low compared to the world average level. There is considerable potential for growth, particularly in rural areas where current consumption levels are low. Given the land constraint and the huge population base, the expected expansion in domestic demand for bananas and tropical fruits in China would have to be satisfied by imports from the world market.

12. Appropriate marketing strategies must be developed for exporting countries to take advantage of the potential growth in demand for bananas and tropical fruits in China. The less than unit income elasticity implies that the increase in demand for bananas and tropical fruits would be much slower than income growth. In addition, a less than unit price elasticity also indicates that any sharp increase in supply will induce a significant drop in market price. Therefore, any supply expansion surpassing demand will result in lower sales revenue. Consequently, any strategy to develop the markets for bananas and tropical fruits in China must take cognizance of the need to expand supply in an orderly fashion.