

Analysis on the Changes and Regional Differences of Edible Vegetable Oil Consumption in Chinese Residents

Songbo Yu^{1, a}, Ting Liu^{1, b, *}

¹Center for Food Security and Strategic Studies, Nanjing University of Finance and Economics, Nanjing, 210003 China

^apaper1212@126.com, ^bnufe_food@163.com

Abstract

In response to the strategy of “Healthy China Action (2019-2030)” and promoting reasonable diet, this paper reviews the consumption of edible vegetable oil by Chinese residents since the new century. The study found that: First, the total consumption of edible vegetable oil in China experienced a change process from rapid growth to slowing growth and finally stabilizing. Second, the focus of Chinese consumer oil consumption structure shifted from rapeseed oil to soybean oil, and the consumption of soybean oil continued to rise. The third is that the average daily intake of edible vegetable oil of Chinese residents is in excess. The fourth is that the consumption level of edible vegetable oil in northern China is slightly higher than that in the south. In order to form a healthy and scientific lifestyle, it is recommended to promote the reduction of edible vegetable oil intake by Chinese residents in different regions and conditions.

Keywords

Vegetable oil; consumption change; consumption structure; regional differences.

1. INTRODUCTION

People's health is an important symbol of national prosperity and national prosperity. With the development of industrialization, urbanization, population aging and changes in the ecological environment and lifestyle, cardiovascular and cerebrovascular diseases have become the first major killer threatening human health. As an important cause of such diseases, it is necessary for the government to analyze and summarize the current consumption of edible oil by Chinese residents, and to propose reasonable dietary recommendations to promote the implementation of the “Healthy China Action (2019-2030)” strategy.

Fat is an important component of the human body, 14% to 19% of the weight of healthy adults is adipose tissue, which not only protects all organs of our body, maintains the body temperature constant, but also constitutes the main component of brain and nervous system. Edible oil is an important source of people's required fat, accounting for about 53% of the total fat. It can meet the body's caloric needs while providing essential fatty acids and fat-soluble vitamins that the body cannot synthesize, which can play a regulatory role in human health. However, the intake of edible oil is not the more, the better, and the increase in total oil intake will increase the risk of obesity. Hooper et al [1] included a systematic review of 33 randomized controlled trials and 10 cohort studies showing that reducing the total fat supply ratio (<30%) in the dietary helps to reduce body weight, the function of total fat in the dietary is reduced by 1% and the body weight is reduced by 0.19kg. Excessive intake of oil not only leads to excessive body fat, but also causes excessive fatty acids in the blood, which increases the risk of cardiovascular disease. Siri-Tarino et al [2] tracked 21,030 50-69-year-old Finns with no

cardiovascular disease for six years and found that high levels of trans fatty acid intake (6.2g/d) and low levels (1.3g/d) In comparison, the multivariate RR of coronary heart disease death was 1.39, indicating a significant positive correlation between trans fatty acids and the risk of death from coronary heart disease. Therefore, controlling oil intake is a necessary way to reduce cardiovascular and cerebrovascular diseases.

Along with the improvement of residents' living standards and the continuous opening of the oil and fats market, China's consumption of edible vegetable oil has entered a period of rapid growth, but it is accompanied by imbalances in inter-regional consumption levels and whether the consumption of vegetable oils by residents is reasonable. How to accurately grasp the growth trend of consumption of edible vegetable oil, narrow the gap between consumption levels of edible vegetable oils in various regions, clarify the substitution relationship between various edible vegetable oils, and guide the reasonable consumption of edible vegetable oil of residents are important issues to be considered in China at present and for a long time in the future. Therefore, combing and analyzing the consumption changes of edible vegetable oil in China residents and the consumption differences between different regions have important reference value for the rational formulation of edible vegetable oil industry policy.

2. TOTAL CONSUMPTION OF EDIBLE VEGETABLE OIL

With the expansion of China's population and the improvement of residents' income level, the demand for edible vegetable oil is also increasing gradually. Figure 1 shows the total consumption of edible vegetable oil and per capita consumption in China from 2000 to 2017. Both the total and the per capita consumption have maintained a high growth momentum. In terms of the total amount, the annual consumption of edible vegetable oil in China has steadily increased, from 11.73 million tons in 2000, it raised rapidly to 35.71 million tons in 2017, with a cumulative increase of 204.43%, an average annual growth rate of nearly 6.77%. In terms of per capita consumption, the consumption level of edible vegetable oil also presents a trend of increasing year by year, from 9.25 kg in 2000 to 25.82 kg in 2017, with a cumulative increase of 179.13% and an average annual growth rate of 6.22%.

According to the recommendations of the Dietary Guidelines for Chinese Residents (2016), residents with different energy consumption levels have a reference range of 25-30 grams per person per day for recommended intake of edible oil. From the actual consumption situation, the daily intake of edible vegetable oil in China gradually surpassed this reference value after 2003. The comparison found that the per capita daily consumption of edible vegetable oil reached 70.75 grams in 2017, which is 2.35 times of the recommended intake, belong to the state of excessive oil intake, which seriously affects the health of residents and aggravates the occurrence of chronic diseases such as obesity, diabetes, coronary heart disease, hypertension and arteriosclerosis.

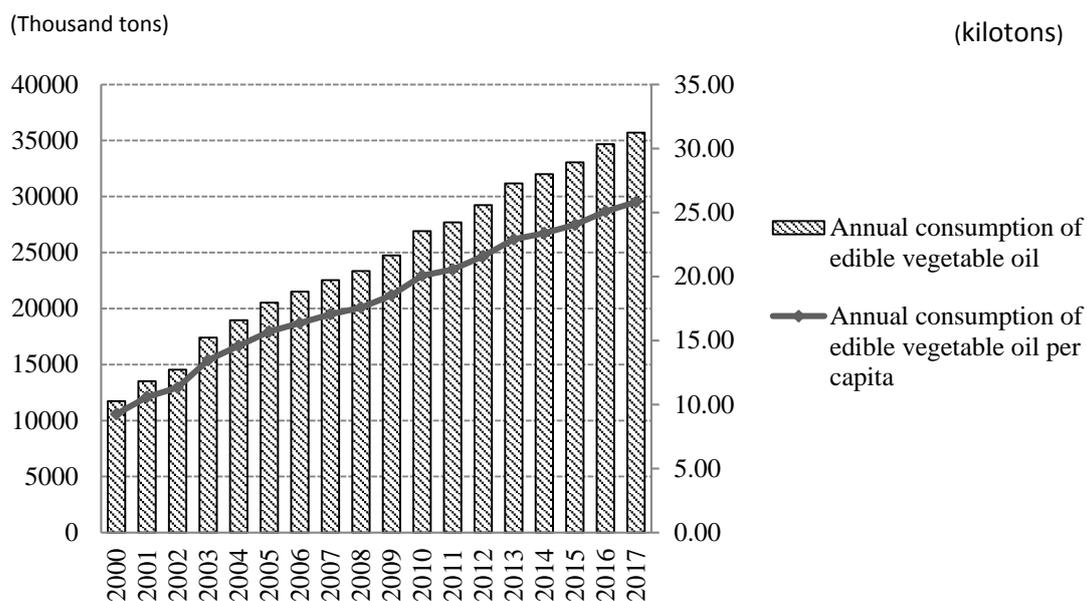


Figure 1. Total consumption and per capita consumption of edible vegetable oil in China from 2000 to 2017

Source: USDA Foreign Agricultural Service (FAS) Database

3. CONSUMPTION STRUCTURE OF EDIBLE VEGETABLE OIL

There is a certain substitution relationship between different edible vegetable oils. Before 2000, domestic consumption of edible vegetable oil was mainly rapeseed oil. The proportion of consumption in this stage was: rapeseed oil>soybean oil>peanut oil>palm oil [3]. At this time, the self-sufficiency rate of edible oil is high, and the import volume is low. Rapeseed is the most important oil crop, and rapeseed oil naturally becomes the largest consumption of oil varieties. After 2000, with the steady growth of the total consumption of edible vegetable oil, domestic oil supply began to appear insufficient, and the amount of imported oil increased year by year. In particular, the import volume of soybean, soybean oil and palm oil increased significantly, and the consumption structure of edible oil also changed. At this stage, the proportion of edible vegetable oil consumption structure is: soybean oil> rapeseed oil> palm oil> peanut oil [4], and the focus of variety structure began to shift to soybean oil [5]. As shown in Table 1, the consumption of soybean oil and rapeseed oil in 2002 was 4,137kt and 4,213kt respectively, and the consumption of rapeseed oil was still slightly higher than that of soybean oil. However, in 2003, the consumption of domestic soybean oil rose sharply to 6,389kt, it has become the main consumer variety of domestic edible vegetable oil. In 2017, the consumption of soybean oil, rapeseed oil, palm oil and peanut oil in China's four major vegetable oil varieties reached 16,350kt, 8,400kt, 4,820kt and 2,967kt, respectively, accounting for the proportion of edible vegetable oil consumption reached 46%, 23%, 14% and 8% respectively, the four types of edible vegetable oil consumption share basic remain at around ninety percent, and the concentration of vegetable oil consumption has been increasing.

Table 1. Consumption varieties and quantities of edible vegetable oil in China from 2000 to 2017

Unit: kt

| Year | Soybean oil | Rapeseed oil | Palm oil | Peanut oil | Sunflower seed oil | other |
|------|-------------|--------------|----------|------------|--------------------|-------|
| 2000 | 2871 | 4285 | 1200 | 2020 | 199 | 302 |
| 2001 | 3265 | 4190 | 1879 | 2110 | 215 | 429 |
| 2002 | 4137 | 4213 | 2470 | 2149 | 230 | 230 |
| 2003 | 6389 | 3658 | 3525 | 2242 | 313 | 1281 |
| 2004 | 7174 | 4363 | 3710 | 2100 | 329 | 1288 |
| 2005 | 7214 | 4756 | 4363 | 2222 | 248 | 1641 |
| 2006 | 7607 | 4545 | 4974 | 2256 | 390 | 1737 |
| 2007 | 8670 | 4343 | 5138 | 2007 | 329 | 2073 |
| 2008 | 9693 | 4139 | 5222 | 2016 | 129 | 2144 |
| 2009 | 9486 | 4853 | 5618 | 2184 | 355 | 2158 |
| 2010 | 10435 | 5641 | 5930 | 2227 | 432 | 2188 |
| 2011 | 11109 | 5965 | 5797 | 2432 | 362 | 2026 |
| 2012 | 11944 | 6255 | 5841 | 2585 | 469 | 2144 |
| 2013 | 12545 | 6316 | 6389 | 2745 | 838 | 2335 |
| 2014 | 13657 | 7025 | 5749 | 2789 | 1021 | 2131 |
| 2015 | 14200 | 7750 | 5700 | 2819 | 998 | 2141 |
| 2016 | 15250 | 8300 | 4800 | 2889 | 1379 | 2002 |
| 2017 | 16350 | 8400 | 4820 | 2967 | 1279 | 1892 |

Source: USDA Foreign Agricultural Service (FAS) Database

From the change trend of consumption of various edible vegetable oil varieties (as shown in figure 2), there is a significant difference in the growth rate of consumption of different edible vegetable oil varieties. Specifically, the growth trend of soybean oil is the most obvious. In 2017, soybean consumption reached a maximum value of 16,350kt, 5.7 times that of 2000, with a large increase, with an annual growth rate of 10.4%. As the second largest consumer variety, rapeseed oil has grown relatively slowly, with an average annual growth rate of only 3.8%. The total consumption of palm oil is relatively high, but the consumption is fluctuating. In 2013, after the total consumption reached 6,389kt, it began to decline by 10% per year. In 2017, the consumption of palm oil in China was only 4,820kt, falling back to the consumption level in 2006, the consumption of other varieties is relatively stable, the consumption of peanut oil, sunflower oil and other varieties of vegetable oil has not changed much. The consumption level of peanut oil has been maintained between 2000 and 3000kt and has never exceeded 3,000kt. The growth of sunflower oil is more obvious. Compared with 2000, the consumption of sunflower oil in 2017 increased nearly 6 times to 1279kt. In addition, the consumption of other small varieties of vegetable oil increased significantly, indicating that the current edible vegetable oil consumption market began to enter the structural adjustment period, the market requires end products to be more subdivided, and the quality requirements are higher.

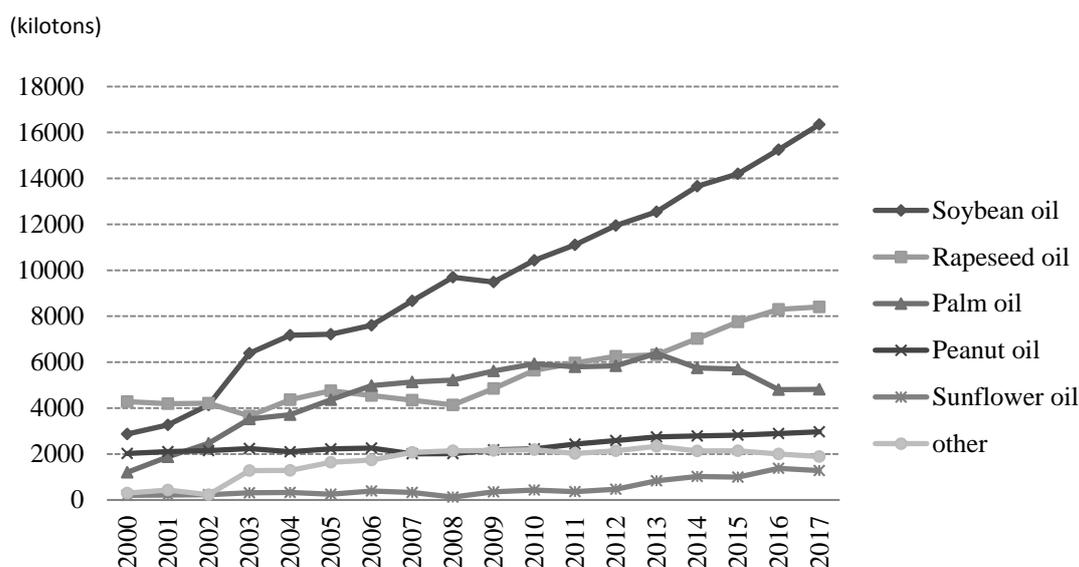


Figure 2. Variation trends of various edible vegetable oil consumption varieties in China from 2000 to 2017

Source: USDA Foreign Agricultural Service (FAS) Database

The current shift in the focus of China's edible vegetable oil consumption to soybean oil, because the rapid economic development of China after 2000 led to a large increase in the consumption of edible vegetable oil demand. But at this stage, the growth of China's edible vegetable oil production is slow, far from meeting the rapid growth of edible vegetable oil consumption demand. In 2001, China joined the World Trade Organization to implement tariff quota management on soybean oil, palm oil and rapeseed oil. Beginning in 2006, China lifted the tariff quota restriction for vegetable oils and implemented a single tariff of 9%. A single tariff of 3% is still imposed on soybeans, and rapeseed has eliminated quota restrictions, and tariffs have fallen from 12% in 2001 to 9%. The increase in market openness has led to a rapid increase in the import of edible vegetable oil. The large import of foreign soybeans and soybean oil makes the price of soybean oil more advantageous than other edible vegetable oil varieties [6, 7].

4. THE NORTH-SOUTH DIFFERENCE BETWEEN EDIBLE VEGETABLE OIL CONSUMPTION

In terms of the total amount, the total consumption of edible vegetable oil in the southern and northern regions of China showed an upward trend. Specifically, the total consumption of edible vegetable oil in the northern region in 2000 was 3879.8kt, and in 2017, it rose to 7990.3 kilotons, an increase of 4110.5 kilotons, with an average annual growth rate of 4.1%. In 2000, the total consumption of edible vegetable oil in the southern region was 8471.6kt. In 2017, it rose to 18685.6kt, an increase of 1014kt, with an average annual growth rate of 4.49%. Considering that the provinces and populations in the southern region far exceed the northern regions, Therefore, it is impossible to obtain the characteristics of the difference in the total consumption of vegetable oil from the residents in the north and the south, and it is directly concluded that the consumption of edible vegetable oil in the southern region is higher than that in the northern region, which needs to be further analyzed in combination with the per capita consumption of vegetable oil in the North and South.

As shown in Figure 3, in terms of per capita annual consumption, the annual per capita consumption in the northern region is slightly higher than in the southern region. The data

show that the annual per capita consumption of edible vegetable oil in the northern region was 11.2kg in 2000 and 9.2kg in the southern region. In 2017, the per capita consumption of edible vegetable oil in the northern region was 20.7kg, and 18.6kg in the southern region, nearly doubled and still maintaining the trend of increasing. The possible reason why the consumption of edible oil in the northern region is slightly higher than that in the southern region is that the temperature in northern China is lower than that in the south. Especially in winter, the increase of meat consumption in the diet of northern residents directly drives the increase of vegetable oil consumption. In contrast, the diet in the southern region is relatively light, mostly based on plant foods, and the eating habits characterized by exquisiteness, fineness and ingenuity reduce the intake of vegetable oils to a certain extent. From the perspective of consumption development trend, the southern region and the northern region maintain similar growth trends and growth ranges. The annual per capita consumption of edible vegetable oil in the two regions can be divided into three stages: First, from 2000 to 2008, the annual per capita consumption of vegetable oil of residents in north and south regions was relatively high, and the growth rate was relatively large. Second, from 2009 to 2012, the per capita consumption of edible vegetable oil of residents in the north and south regions has slowed down, and the consumption of edible vegetable oil in the two regions increased relatively little. Third, from 2013 to 2017, the per capita consumption of edible vegetable oil of residents in the north and south regions has slowed down, and the per capita consumption fluctuated slightly between grades. The consumption level has gradually stabilized, mainly due to changes in the dietary structure of residents and changes in dietary concepts. Further estimating the per capita daily consumption of edible vegetable oil in the north and south regions shows that the average daily intake of edible vegetable oil in the north and south regions in 2017 is 49.9 grams and 55.3 grams, respectively, both higher than the recommended intake of 25-30 grams in the Dietary Guidelines for Chinese Residents (2016).

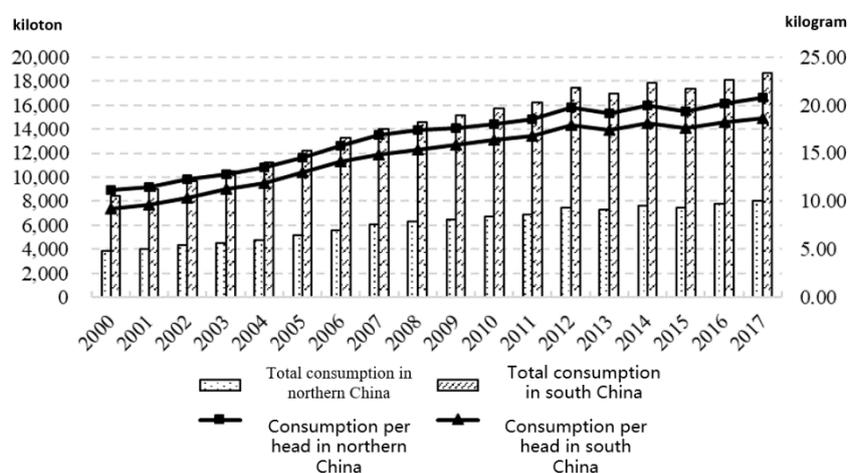


Figure 3. Consumption of edible vegetable oil in North and South China from 2000 to 2017

Source: Breck Database

5. CONCLUSIONS AND POLICY RECOMMENDATIONS

By analyzing the consumption status and regional differences of edible vegetable oil in China in 2000, and can get the following conclusions: First, since the 21st century, China's consumption of edible vegetable oil has experienced a development stage of high increment and high consumption, and the total consumption and per capita consumption have increased significantly, indicating that the improvement of the economy development level and the enhancement of the degree of opening up have significantly improved the consumption level of

edible vegetable oil in China. Second, the consumption structure of edible vegetable oil varieties has gradually shifted from rapeseed oil to soybean oil, and the consumption of soybean oil has increased rapidly. Third, from the consumption of edible vegetable oil in the north and south regions, the consumption of vegetable oil per capita in the northern region is higher than that in the southern region due to the influence of diet and cooking habits. The fourth is from the perspective of the average daily intake of edible vegetable oil. At the national level or at the regional level, it exceeds the recommended intake in the Dietary Guidelines for Chinese Residents (2016), which lays hidden dangers for residents' health.

Based on this, this paper believes that in the formulation of the Healthy China Action Plan, reasonable advice the intake of edible oil, to grasp the characteristics of Chinese edible vegetable oil consumption, and to formulate development policies to meet the needs of different categories of consumers according to local conditions. First, increase the income level of low-income people to promote the consumption level of edible vegetable oil; secondly, make full use of the international and domestic markets to meet the needs of different levels of edible vegetable oil; Finally, strengthen the propaganda of healthy consumption of edible vegetable oil, encourage residents to improve unreasonable dietary structure, intake of oil according to its own energy consumption situation, avoid excessive intake affecting their health.

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