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***Li D.Y., Wu L.P.***

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# ANALYSIS OF THE COMPETITIVENESS OF CHINESE RABBIT INDUSTRY

Li D.Y., Wu L.P.\*

College of Economics and Management, China Agricultural University,  
17 Qinghua Donglu, Haidian District, 100083, Beijing, People's Republic of China  
\*Corresponding author: wulp@cau.edu.cn

## ABSTRACT

This paper analyzes the competitiveness of Chinese rabbit industry since 2000 from both China domestic and global perspectives. From domestic view, we mainly study the comparative advantages, production trend and consumption potential of rabbit products, and from global perspective, the indicators such as international market share, Revealed Comparative Advantage (RCA) and Trade Competitiveness Index are used to measure the competitiveness in international market. It is found that in the domestic market, rabbit products have comparative advantages with good performance, rapid growth in output and great consumption potential. In the international market, the competitiveness of Chinese rabbit industry is strong, but in recent years, its advantage has weakened because of the competition from other countries. In general, the competitiveness of Chinese rabbit industry is strong in both China and world markets.

**Key words:** Rabbit industry, Competitiveness, Comparative advantage

## INTRODUCTION

China is the origin and prosperity center of rabbit family, which has a long history of rabbit breeding. After the reform and opening up, rabbit industry in China has been developing well. The annual average rabbit meat production from 1961 to 1985 was less than 60,000 tons, accounting for only 7% of the world's share, annual growth rate is 7.22%. However, in 2017 the rabbit meat production exceeded 900,000 tons, the annual growth rate from 1986-2017 reaches 8.51%. In 2017, rabbit meat output in China accounted for 62.9% of the world's total rabbit meat production, ranking first in the world.

However, in past several years the development of rabbit industry in China has been stagnating, which is facing adjustment and gradual recovery, and the international trade situation is not optimistic. Therefore, whether Chinese rabbit industry still has advantages in both domestic and international markets, and how competitive the rabbit industry is need to be further studied.

Previous studies mainly analyzed the competitiveness of Chinese rabbit industry either from domestic aspect or international aspect (Ju and Wu, 2013; Luo and Wu, 2019). Therefore, the objective of this paper is to comprehensively consider the domestic and international market, and systematically analyze the competitiveness of Chinese rabbit industry.

## MATERIALS AND METHODS

### Measurement of competitiveness

In China, the breeding scale of meat rabbit accounts for 80% of the total, while angora rabbit, rex rabbit and pet rabbits account for 20%. Therefore, this article will focus on meat rabbits. For the domestic market competitiveness of meat rabbit we mainly analyze the comparative advantages, production trend and consumption potential of rabbit meat. For international market competitiveness, we will mainly study rabbit meat because China has been a major rabbit meat exporter. Following indexes like *International Market Share (IMS)*, *Revealed Comparative Advantage (RCA)* and *Trade*

*Competitiveness (TC)* will be applied to measure the international competitiveness of China's rabbit industry.

**International market share (IMS)**

IMS refers to the share of a country's product exports in the world's total exports of that product (Markusen,1992; Di Angzhao,1992). The formula is:

$$IMS_i = \frac{X_i}{X_w} \times 100\%$$

where  $IMS_i$  represents the international market share of product  $i$ ,  $X_i$  represents the export volume of the country, and  $X_w$  represents the total export volume of the world.

**Revealed comparative advantage index (RCA)**

RCA refers to the proportion of the export value of a certain commodity in a country's total commodity exports divided by the share of the world's total export value of such commodity in the world's total export value of all commodities (Balassa Bela,1965). The function is given by:

$$RCA_{ij} = \frac{\frac{X_{ij}}{X_{it}}}{\frac{X_{wj}}{X_{wt}}}$$

where  $RCA_{ij}$  represents the revealed comparative advantage index of  $j$  commodity in country  $i$ ,  $X_{ij}$  is the export value of  $j$  commodity in country  $i$ ,  $X_{it}$  is the total export value of all commodities in country  $i$ ,  $X_{wj}$  is the total export value of  $j$  commodity in the world,  $X_{wt}$  is the total export value of all commodities in the world. If  $RCA_{ij} > 1$ , it means that  $j$  commodity in country  $i$  has a revealed comparative advantage, otherwise it is not.

**Trade competitiveness index (TC)**

TC can indicate whether a product is net import or net export, and the relative size of the net import or net export, thus reflecting whether a certain product has competitive advantage or not and its degree (Peter Drysdale,1969; Kojima,1964). The formula is as follow:

$$TC_{ij} = \frac{X_{ij} - M_{ij}}{X_{ij} + M_{ij}}$$

where  $TC_{ij}$  is the trade competitiveness index,  $X_{ij}$  and  $M_{ij}$  represent the export volume and import volume of the product  $i$ . The closer  $TC_{ij}$  is to 1, the more internationally competitive the product  $i$  is. The closer  $TC_{ij}$  is to -1, the less the international competitiveness of  $i$  product.

**RESULTS AND DISCUSSION**

**Domestic competitiveness analysis**

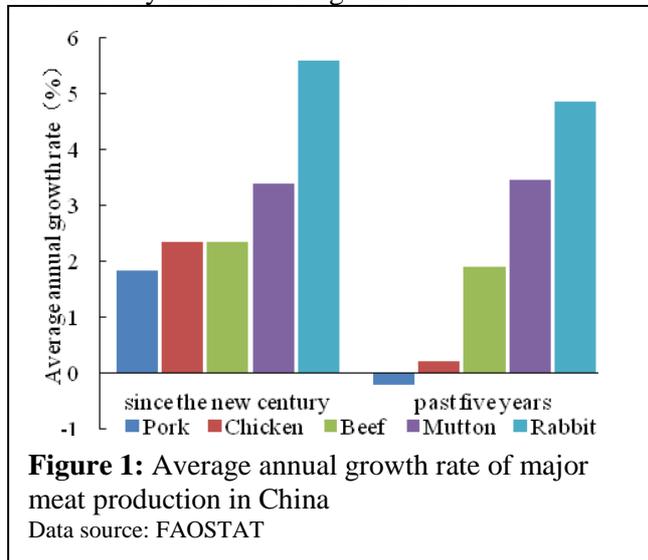
In terms of the performance of rabbit meat, compared with other meats such as pork, beef, mutton and chicken, rabbit meat is a high-quality animal food, which has the characteristics of "three highs and three lows", which is high essential amino acids, high protein and high digestibility, low fat, low cholesterol and low energy. It can ensure the nutrition required by the human body without causing diseases such as obesity, hypertension and arteriosclerosis. The main nutritional content is shown in Table 1.

**Table 1:** Nutritional characteristics of major meat

Three highs	Rabbit	Pork	Beef	Mutton	Chicken	Three lows	Rabbit	Pork	Beef	Mutton	Chicken
Lysine (%)	9.60	3.70	8.00	8.70	8.40	Fat (%)	9.76	26.7	15.9	18.0	7.80
Protein (%)	21.4	15.5	20.1	16.4	19.5	Cholesterol (mg/100g)	45.0	126	106	70.0	69~90
Digestibility (%)	85.0	75.0	55.0	68.0	50.0	Energy (kJ/kg)	676	1284	1255	1097	517

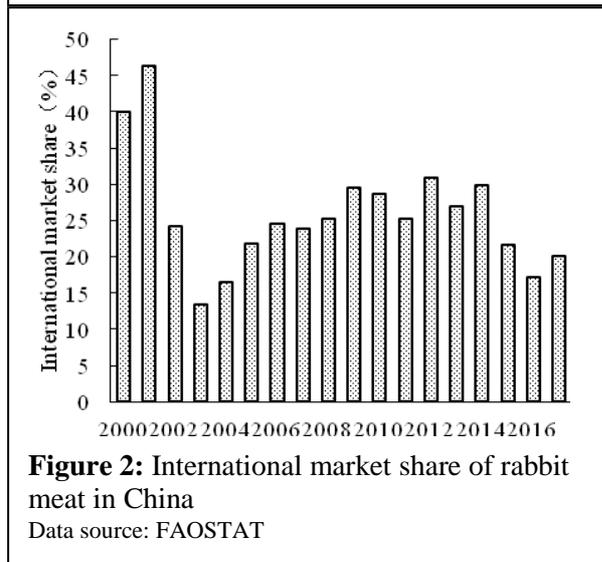
Data source: Gu et al. (2014), Peng et al. (2004)

From the perspective of production and consumption, the output of rabbit meat has grown rapidly and the consumption potential is large. From 2000 to 2017, the output of rabbit meat increased from 377,000 tons to 931,834 tons, with an average annual growth rate of 5.58%, which is much higher than other meats (Figure 1). At present, the average annual per capita consumption of rabbit meat in China is only 619g, which is far lower than those in Sichuan Province (around 4kg per year), the major region of rabbit raising in China. With the higher awareness of health of consumers and the development of market diversification, the production and consumption of rabbit meat will continuously maintain a large increase.



**Figure 1:** Average annual growth rate of major meat production in China

Data source: FAOSTAT



**Figure 2:** International market share of rabbit meat in China

Data source: FAOSTAT

**International competitiveness analysis**

From the *International Market Share* (Figure 2), the international competitiveness of Chinese rabbit meat is strong. From 2000 to 2017, the overall market share of Chinese rabbit meat showed a trend of first decline then increase. At the beginning of the 21st century, Chinese rabbit meat market share was very high, reaching 46.4% in 2001, and it began to decline in 2002, with the lowest point being 13.5% in 2003. In recent years, the share of Chinese rabbit meat has fluctuated continuously, with an average of 24.6% from 2011 to 2017. Compared with other major rabbit meat exporters in global markets, although the market share of China has declined, the average annual share since the 21st century is still up to 26.0%, which ranks among the top in the world.

From the *Revealed Comparative Advantage* index (Table 2), the RCAs of Chinese rabbit meat continue to fluctuate, showing an overall downward trend, with an average annual rate of 2.56, indicating that although Chinese rabbit meat has strong international competitiveness, its advantage is diminishing. In order to be more practical, we also replace the export value of China and the world with meat export value of China and the world respectively. After data conversion, the RCA index of Chinese rabbit meat increased, showing an overall upward trend. This means that, compared with other meat products, Chinese rabbit meat still has strong comparative advantages in global markets continuously.

**Table 2:** Revealed comparative advantage index of rabbit meat in China

Year	RCA (all commodities)	RCA (meat)	Year	RCA (all commodities)	RCA (meat)
2000	8.35	16.6	2009	2.70	28.8
2001	7.60	15.6	2010	2.41	23.6
2002	2.34	7.04	2011	1.96	21.9
2003	0.92	3.82	2012	2.25	29.8
2004	0.97	4.85	2013	1.98	28.4
2005	1.76	10.7	2014	2.35	31.6
2006	1.84	12.9	2015	1.53	22.4
2007	1.98	18.1	2016	1.28	20.9
2008	2.24	24.0	2017	1.64	28.2

Data source: FAOSTAT, WITS

From the *trade competitiveness* index (Table 3), Chinese rabbit meat trade has strong international competitiveness, but it faces fierce market competition. From 2000 to 2017, Chinese rabbit meat TC indexes averaged 0.99, which was very close to 1, indicating strong competitiveness. The TC index has shown a downward trend since 2013, indicating that the competitiveness of Chinese rabbit meat has been weakened. Compared with other rabbit meat exporting countries, the TC index of Argentina and Hungary are close to 1, which shows strong competition with China, and France and Spain also have certain competitiveness.

**Table 3:** The trade competitiveness index of major rabbit exporting countries

year	Argentina	Belgium	China	France	Hungary	Italy	Netherlands	Spain
2000	1.00	-0.22	1.00	-0.16	1.00	-0.32	-0.12	0.95
2001	0.99	-0.14	1.00	-0.19	1.00	-0.40	-0.18	0.76
2002	1.00	-0.24	1.00	0.18	1.00	-0.13	-0.05	0.73
2003	1.00	-0.36	0.99	0.25	1.00	0.40	-0.03	0.78
2004	1.00	-0.20	1.00	0.28	1.00	0.29	-0.41	0.83
2005	0.99	-0.16	0.99	0.18	1.00	0.04	-0.32	0.62
2006	0.98	-0.09	1.00	0.25	1.00	-0.01	-0.10	0.57
2007	0.99	-0.09	1.00	0.24	1.00	-0.02	-0.19	0.63
2008	1.00	-0.05	1.00	0.57	0.99	-0.24	-0.62	0.52
2009	1.00	0.00	1.00	0.53	1.00	-0.38	-0.06	0.56
2010	1.00	-0.02	1.00	0.37	0.99	-0.47	0.01	0.78
2011	1.00	-0.01	1.00	0.49	0.99	-0.45	0.07	0.78
2012	1.00	0.00	1.00	0.20	0.95	-0.45	0.10	0.85
2013	1.00	0.07	0.98	0.39	0.94	-0.52	0.02	0.84
2014	1.00	-0.02	0.99	0.43	0.94	-0.47	0.32	0.79
2015	1.00	0.01	0.99	0.33	1.00	-0.51	-0.12	0.90
2016	1.00	-0.05	0.98	0.44	1.00	-0.38	-0.04	0.87
2017	1.00	-0.01	0.95	0.51	0.99	-0.07	-0.30	0.79

Data source: FAOSTAT

## CONCLUSIONS

Results show that in the domestic market, rabbit products have comparative advantages with good performance, rapid growth in output and great consumption potential. In the international market, generally the competitiveness of Chinese rabbit industry is very strong, but in recent years, its advantage has weakened because of the competition from Argentina, Hungary, France, Spain and other countries. In general, the competitiveness of Chinese rabbit industry is strong from both domestic and global views.

## ACKNOWLEDGEMENTS

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 Nantes, France

# ***Analysis of the Competitiveness of Chinese Rabbit Industry***

Danyang LI & Laping WU  
College of Economics and Management  
China Agricultural University





# 1. INTRODUCTION

- Long history of rabbit breeding in China.
- Well-developed rabbit industry in China.

year	production	global market share	growth rate
1961-1985	<60,000 tons	7%	7.22%
1986-2017	900,000 tons	62.9%	8.51%

- Facing adjustment and gradual recovery in recent years.
- Whether Chinese rabbit industry still has advantages?
- How competitive the rabbit industry is?



## 2. MATERIALS AND METHODS

### ● Domestic Market

- Comparative Advantages
- Production Trend
- Consumption Potential

### ● International Market

- International Market Share (IMS)
- Revealed Comparative Advantage (RCA)
- Trade Competitiveness (TC)

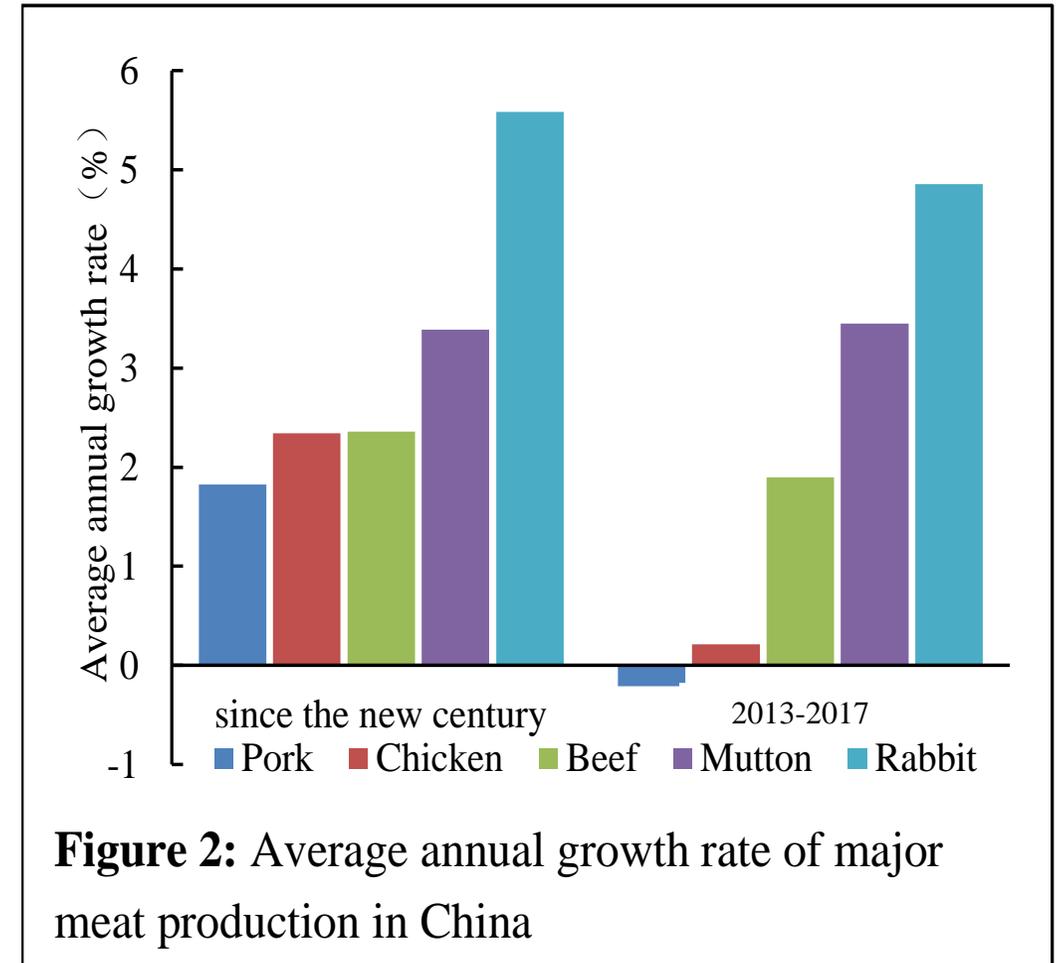
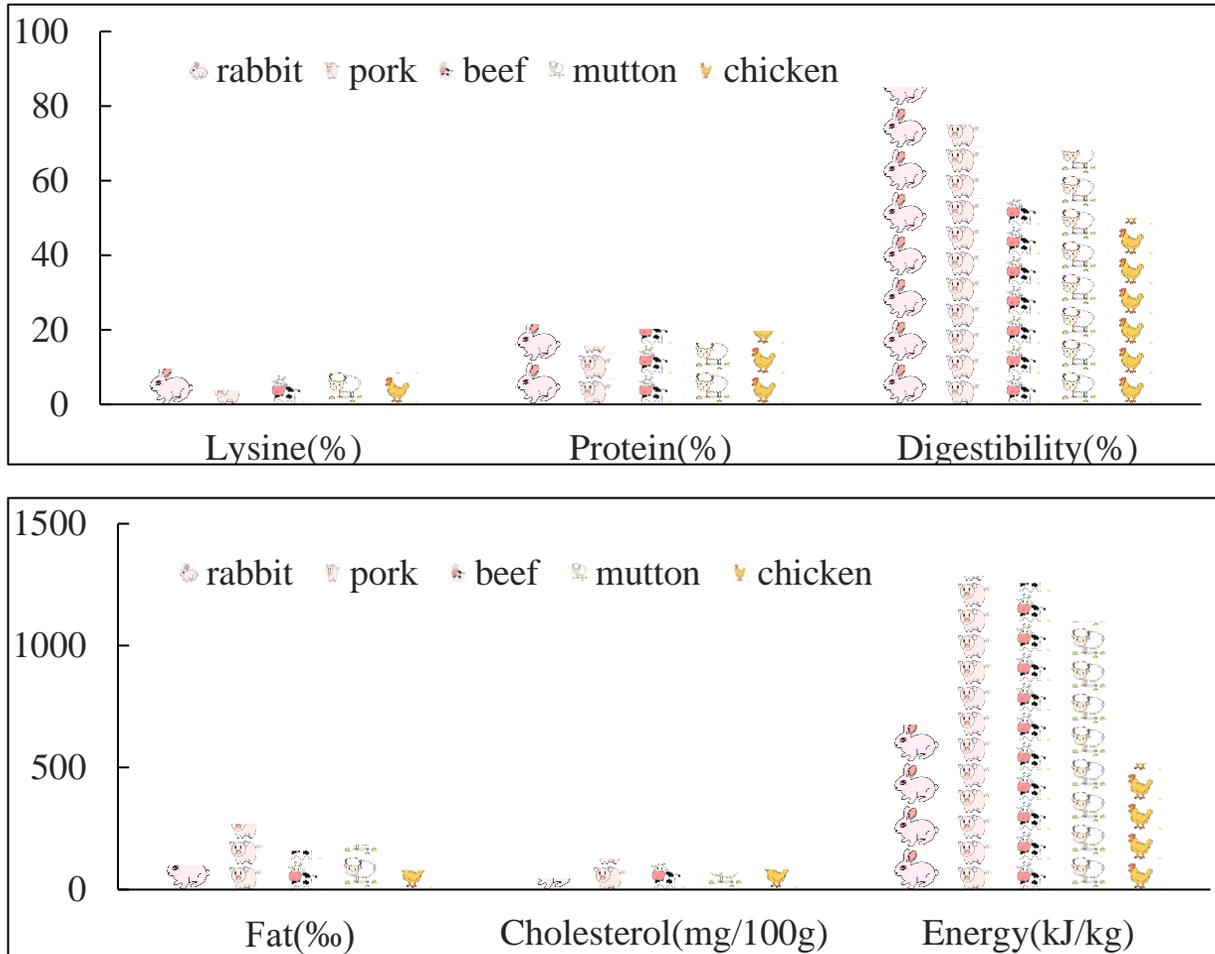
$$IMS_i = \frac{X_i}{X_w} \times 100\%$$

$$RCA_{ij} = (X_{ij} / X_{it}) / (X_{wj} / X_{wt})$$

$$TC_{ij} = (X_{ij} - M_{ij}) / (X_{ij} + M_{ij})$$

# 3. RESULTS AND DISCUSSION

## ● Domestic competitiveness analysis

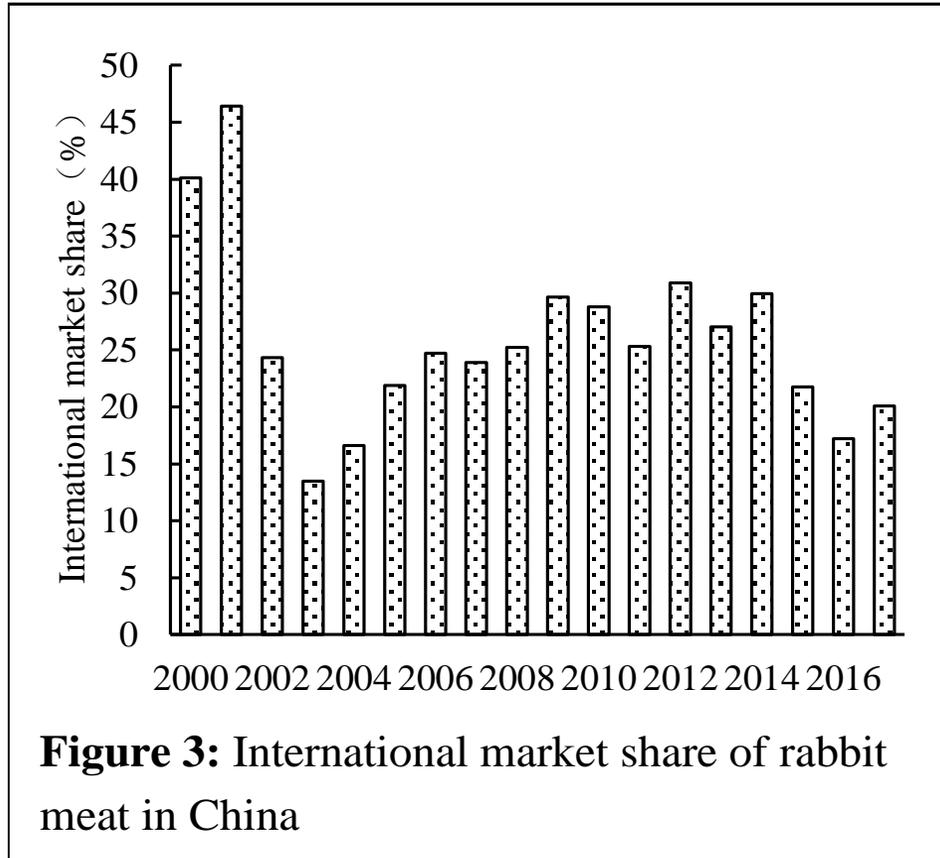


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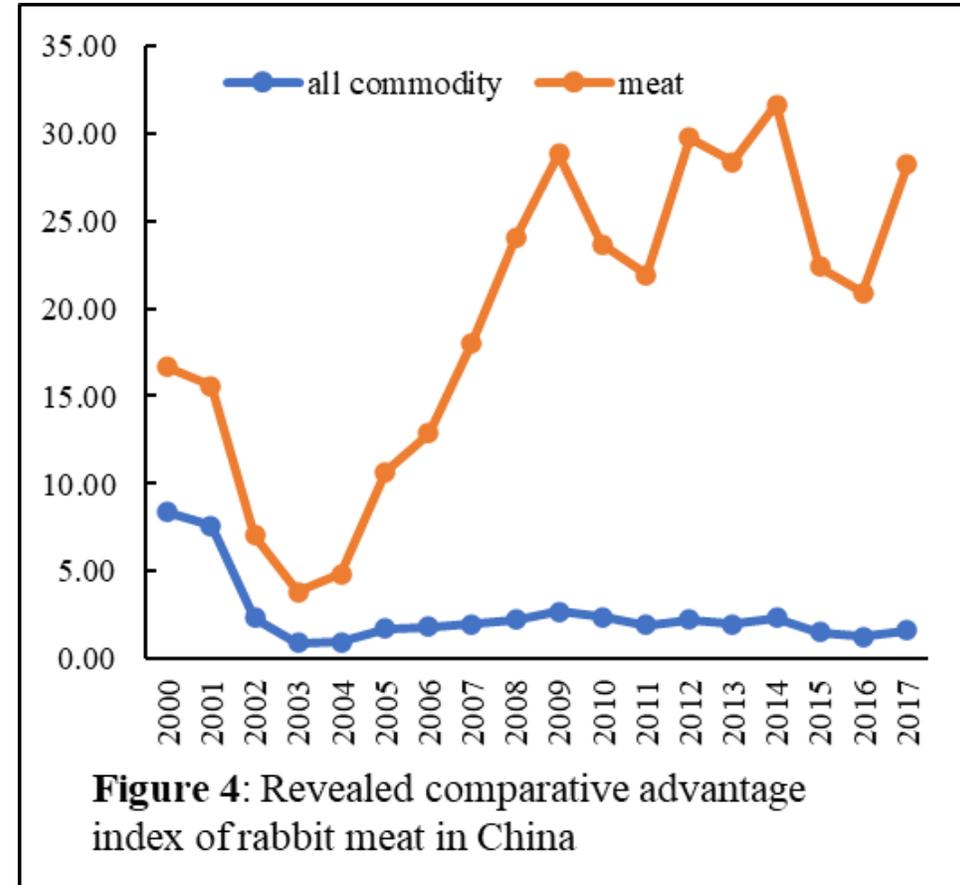
Data source: Gu et al. (2014), Peng et al. (2004)

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- International competitiveness analysis



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# ● International competitiveness analysis



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Data source: FAOSTAT

# 4. CONCLUSIONS



- Domestic market

comparative advantages with good performance, rapid growth in output and great consumption potential

- International market

the competitiveness is strong, but weakened in recent years because of the competition

- In general

the competitiveness of Chinese rabbit industry is strong from both domestic and global views



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***Thanks for your attention!***