



Opportunity or Trap?

Intensive Phenomenon of Feed and Breeding Industry under Market Economy

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ABSTRACT. Since the millennium, the intensification of feed industry has shown an irresistible trend in China under the influence of political economy, and has derived a variety of intensive business models. The power of market capital has brought unprecedented vitality to the feed industry. Although the "corporation plus farmers" model has driven the new growth of the rural economy and companies themselves, it has also buried huge hidden dangers for the market. These collectivized feed industry enterprises have doubled the risks they bear during the market turmoil and it also foreshadows the negative impact of domestic capacity over-saturation. When there is a huge fluctuation in the market, many capital or enterprises have speculative intentions for short-term market fluctuations, and there are still a large number of capital constantly entering the breeding and feed industry, resulting in the continuous downturn of market prices, which puts great pressure and losses on enterprises and farmers. This paper discussed how group capital enter the agriculture and animal husbandry industry in the current context, and how rural retail investors and what SMEs can learn from the industry giants to develop healthily in the long term.

Keywords: Feed and breeding industry, Over-saturation, Intensive economy

1 introduction

Feed industry refers to the feed industry in a broad sense. Driven by the intensive economy, it has gradually covered many industries such as breeding and additives. In recent 20 years, it has shown multiple and different intensive patterns. Under the influence of market economy and political economy, the intensive phenomenon of feed industry presents an irresistible trend in China. In 2018, a pandemic of African swine fever virus is profoundly affecting Chinese dining tables and other industries related to pig breeding. It is worth thinking about how to treat the process of accelerating the intensification of agriculture and animal husbandry industry and how to rationally guide capital to enter the market of agriculture and animal husbandry industry.

Affected by African swine fever in 2017, the price of live pigs in China rose sharply in 2019, which attracted a large number of financial forces to settle in the pig in-

dustry. Under the over-saturated stock production, pig prices have experienced a roller coaster crash, and many small and medium-sized enterprises and even listed companies have been greatly affected by the huge fluctuations in pig prices. However, the speculative capital is still ready to "bargain hunting". Many pig enterprises, such as Muyuan Group and Wens, issued sales briefings in February 2022, stating that commodity pig prices were still declining, showing a downward trend both month on month and year-on-year. Industry insiders believe that the current downturn in pig prices is mainly due to excess supply. With the acceleration of the pace of capacity removal in the industry, it is optimistic that it will gradually improve during the year, but the specific market trend depends on the length and depth of capacity removal [1]. The continuous decline in pig prices has led to a decline in the income of many pig enterprises. According to the sales data of various listed pig enterprises since this year, although the sales performance is uneven, the price decline is the common main line, of which the month on month decline is mostly more than 10%, and the year-on-year decline is more than 50% [2].

The development of agriculture and animal husbandry has experienced various forms of intensification, such as corporation plus farmers, the settlement mode, integrated Mode. However, when these business models are affected by external factors, the interests of enterprises and farmers will be affected to varying degrees. When there is a huge fluctuation gap in the market, many capital or enterprises have speculative intentions for short-term market fluctuations, and there are still a large number of capital constantly entering the breeding industry, resulting in the continuous downturn of market prices, causing huge losses for the group itself, enterprises and farmers in the industrial chain. Therefore, this paper will discuss how group capital should rationally enter the agriculture and animal husbandry industry in the current context, and how rural retail investors and small and medium-sized private enterprises can develop healthily in the long term.

2 methods

This paper adopts the research method of case analysis. Based on the interpretation of the global economy, this paper attempts to summarize the current situation and reasons for the continuous decline of China's intensive feed breeding industry under the background of international trade. Then, the focus of this paper is to analyze the representative enterprises in the domestic feed breeding industry, and summarize their similarities and differences in the same economic environment through literature and interviews. The sample selection principle is to select 2-3 enterprises with strong profitability and large losses according to the financial statements and profits disclosed in the spring of 2021 to 2022.

Through the case analysis of four typical enterprises (Zhengbang, Wens, New Hope and Muyuan), this paper will try to find out the reasons for their different business performance under the same market background, and then summarize and explore the methods suitable for enterprises and farmers at different stages and scales to

cope with the impact of industrial shrinkage and recession. Finally, this paper will prospect the future development of feed breeding industry in China.

3 Market analysis

3.1 The Meat Consumption Market Shrank

China's economic depends on exports [3], which has a huge surplus with imports. Since 2018, affected by the tightening of the international trade situation and the covid-19 epidemic, export trade has shrunk, leading to a slowdown in China's economic growth and reaching the inflection point of growth dividends [4].

With the reduction of China's export goods, many domestic manufacturing enterprises have closed down or contracted, and a large number of workers have flowed into the unemployment market. This phenomenon has directly affected the reduction of market consumption power, and the social inflation rate has gradually increased.

Under the background of austerity, the speed of industrial resource integration and merger has accelerated, which has promoted the gradual improvement of the degree of automatic production of enterprises. Many group companies have laid off workers on a large scale to varying degrees, which once again promoted the increase of urban unemployment.

The working class has become the largest consumer group of meat products because they need to consume a lot of protein every day. With the decline of the purchasing power of the working class, the consumption of meat products has decreased significantly, while the stock has remained high. This led to an oversupply in the meat market, a sharp decline in the overall price, and even fell below the breeding cost line, leading to large-scale industry losses [5].

However, in 2017, when African swine fever ravaged China, the soaring price of pigs brought a foam-like prosperity to the breeding enterprises. The dividends of the pig breeding industry have attracted countless speculative capital from all walks of life in the market, such as construction, real estate and education, while the government and relevant scholars advocated that the production capacity of breeding feed should be reduced in 2019, countless capital speculation still entered the market ceaselessly.

3.2 Raising Cost of Livestock and Poultry Breeding

With the surge of domestic livestock and poultry stocks, the demand for corn has increased significantly in China, since 2020. China's imports of agricultural products increased rapidly. Corn is the most important staple food in China's feed industry. In 2021, imports reached 28.36 million tons, an increase of 151.1%, breaking the quota ceiling and hitting a record high [6]. Soybean meal, as an indispensable source of protein in feed, also shows the same trend.

In the context of the global economic contraction, the United States has unwound the balance sheet and increased interest rates in order to stimulate its economy, and the prices of various agricultural products have increased. In order to support the sur-

vival of domestic enterprises, China reduced the reserve requirement in an all-round way. At the same time, in order to protect the price of agricultural products, China canceled the order of 120000 tons of old season corn imported from the USA in 2021, so did other feed staple grain. The vacancy in the domestic corn demand market has been further increased, and the price of corn soybean meal has remained high, which has significantly increased the cost pressure of feed enterprises and breeding enterprise.

3.3 Lower Profit Ratio of Feed and Breeding Industry

The inflationary pressure of feed staple material was transmitted to the increasing price of meat, which led to the continuous contraction of the mass meat consumption market under the double blow of the rising price of meat products and the purchasing power caused by the unemployment rate. In the context of huge stock, although the price of meat has grown higher since may of 2022, the profit margin continues to be compressed and reduced due to the rising cost [7].

Some experts pointed out that food crops may remain high and volatile in the next three years, which will aggravate the contraction of consumers, exacerbate the rise of unemployment and enterprise bankruptcy, and have a negative impact on the peaceful and stable development of society [8]. At the same time, it will be a protracted war for the feed breeding industry. SMEs with insufficient financial strength will face unbearable pressure and risks in this cycle, and intensive enterprises with heavy assets will also face higher losses.

4 Case study of typical intensive enterprises

4.1 Corporation plus farmers: Zhengbang Technology and Wens Group

Zhengbang's fattening commercial pigs are mainly cultivated through the "company + farmers" mode, accounting for more than 40% of the total production capacity [9]. This mode is mainly based on the mature management mode of self breeding and self breeding of the company, splitting the fattening pig breeding business chain, and building a new business mode of cooperative breeding and division of labor and cooperation with farmers. The company undertakes the unified procurement and supply of feed, piglets, veterinary medicine vaccines and other raw materials, the output of breeding technology, the sales of fat pigs, etc., and farmers undertake the construction of pig farms, the feeding and management of fat pigs, etc. According to the principle of equal rights and responsibilities, the company and farmers settle costs and benefits, share their responsibilities and benefits, and form a close long-term cooperative business form in the pig breeding business.

However, in the face of the tightening of the breeding feed industry, Zhengbang technology revealed that 542 million yuan of commercial tickets were overdue due to the shortage of working capital, which triggered a heated debate in the industry. In the two days from June 9 to 10, the share price of Zhengbang technology fell by 11.18%, the lowest share price in nearly three years. As of the closing on June 10, the compa-

ny's share price was 5.48 yuan / share, with a market value of 17.2 billion yuan, which has evaporated 80% compared with the market value of 80 billion yuan at the peak in 2020. In 2021, Zhengbang technology lost 18.8 billion yuan in the whole year, ranking first among the leading pig enterprises in terms of loss; The total net profit of the company since its listing in 2007 is only 9.9 billion yuan, which means that its 14 year profit was "cleared once" last year.

Although the whole industry is facing great pressure and the whole industry is in a state of not making money, it seems that the overall loss rate of Zhengbang technology is higher than other enterprises.

After carefully analyzing the data of the open market, it is showed that the core reason why Zhengbang technology has such a phenomenon is that Zhengbang adopted the strategy of large-scale expansion when the market was relatively high. And the whole operation mode focuses too much on the upstream and downstream of the "pork" industrial chain and related industries. This strategy has led the whole Zhengbang technology to a trough with the "pig cycle".

Moreover, the expansion rhythm of Zhengbang technology's high debt ratio did not effectively analyze the market situation, so that it misjudged the form, leading to problems. In the face of market impact, Zhengbang repeatedly defaulted on cooperative farmers due to excessive company operation pressure and the dominant advantage of "companies plus farmers", resulting in unexpected impact and impact on this cooperation mode.

The company plus farmer model is characterized by a win-win situation, but the disadvantage that is difficult to ignore is that the group often plays an absolutely dominant role in cooperation [10], and farmers often become accessories of enterprises, and most of their income comes from the group's cooperation commitments. Once the main body of the company is impacted by the market, in order to protect the company's own interests, the cooperative relationship promised to farmers under this mode will be very difficult to implement, which will lead to a huge threat to these farmers.

As a "company + farmer" model, Wen's group and Zhengbang are facing the same loss problem.

In 2021, Wynn's annual operating income was about 64.963 billion yuan, and its net profit loss was 13.337 billion yuan, the worst performance since its listing.

Once, the "company + farmer" model was once known as the "Wen's model". This model requires less assets and is highly replicable, and the scale of Wen's shares has increased all the way. But so far, the disadvantages of this model have also emerged: difficult to control quality, low stability, and the increment may reach the ceiling. However, we have to think about whether more and more companies are developing and growing in this way because of strong replicability, which has also squeezed part of Wen's market.

Looking back at the performance of Wynn since its listing in 2015, we can find that its net operating profit began to turn after reaching a high point in 2019. When the pig price soared in 2020, its performance fell year-on-year, giving other pig enterprises the opportunity to surpass. According to the 2021 performance express released by Wen's shares: in short, the reason for the loss is that the pig price has fallen sharply, the breeding cost has increased, and the cost is much higher than the income.

According to statistics, the number of farmers in Wen's joint-stock cooperative has decreased year by year. From 2016 to 2020, the number of Wen's joint-stock cooperative farmers was 58600, 55400, 50000, 49800 and 48000 respectively. By the end of June 2021, the number of cooperative farmers had become 46700. With regard to this phenomenon, Wen's shares explained that the main reason for the decrease in the number of cooperative farmers is that farmers' single batch feeding scale has increased, production efficiency has improved, and some inefficient farmers have voluntarily withdrawn from cooperation.

The "minimum recovery" in the "company + farmer" model means that the profit space of farmers should be guaranteed every year. Even if the market changes, the minimum price promised to farmers should be given. The downward price of pigs will aggravate the financial pressure on Wen's shares.

Of course, in recent years, Wen's shares have also upgraded the mode of cooperation, becoming a "company + modern breeding community" mode. The upgraded mode is that the company is responsible for renting the land of the whole breeding community, and doing a unified job in water, electricity, roads, land, construction planning and handling of business licenses. Farmers come to the park to cooperate with the company. In addition, the industrial sector of Wen's group is not fully pressed on the pig industry like Zhengbang technology. Wen's shares also have other businesses such as chicken and duck breeding (but the whole poultry industry is also in the stage of low profitability). The more diversified Wynn group still maintains a certain development potential in the difficulties.

4.2 Settlement Mode: New Hope Group

New Hope Group is based on the agriculture and animal husbandry industry and pays attention to steady development. Its business involves feed, breeding, meat products, financial investment, commerce and trade, etc. In 2007, the pig industry began to be built. In 2012, the enterprise focused on the pig breeding industry. At the end of 2015, the settlement pig breeding model was established, and after exploration and practice, it continued to iterate and optimize, becoming one of the benchmark models of the industry. The "settlement type" mode (or colony type) of new New Hope is to systematically integrate local industrial chains, feed enterprises and related resources, cultivate contracted farmers in the base, build breeding and commercial pig breeding enterprises, give play to the premium ability of food enterprises, and create regional pig breeding settlements.

The so-called "Settlement Type" has three aspects: first, a number of breeding farms and commercial fattening farms have been formed in local areas, with the annual production capacity of 300000 million high-quality commercial pigs; Second, the gathering of professional talents, such as production management, veterinary, nutrition, breeding and other pig breeding professionals in the region; The third is the aggregation of pig industry chain links: pig breeding farms, fattening farms, feed factories, slaughterhouses, etc., forming a closed industrial settlement, improving production efficiency and reducing product costs. Among them, the gathering of ancestral farms and parental farms in pig breeding farms is the most critical, which ensures that

the parental pigs in a settlement can be stably updated between generations, so as to realize the most balanced combination of pig farm hardware capacity and parental pigs in the whole cycle, and then realize the optimal cost.

In fact, New Hope is also facing the dilution of internal management capacity caused by the rapid development, which is directly reflected in the extensive management of some pig farms and has been fined by the environmental protection department for many times. The direct characteristic of the settlement business model is regionalization, industrialization and standardization. Due to the excessive industrial chains involved and the wide dispersion of rights, with the continuous expansion of enterprises, it poses a huge challenge to the management ability. Most of the enterprises in the settlement have retained a certain degree of autonomy of the original enterprises by means of cooperation or partial holding, but this has hindered the standardized management of new hope. In the face of fluctuations in raw material prices, subsidiaries with independent accounting often inevitably sacrifice some quality assurance in cost control, which has a negative impact on the loyalty of end customers and brands.

Another major feature of the operation mode of settlement is the sharing of marginal costs. The larger the scale, the higher the profits saved. This virtuous cycle promotes the continuous expansion and scale-up of new hope. But at the same time, in the context of the contraction of the livestock and poultry market, the market demand is narrowed, and the expansion speed of enterprises does not meet expectations, which is likely to directly lead to the increase of marginal costs, thus putting pressure on the normal operation of enterprises in vigorous expansion. In addition, when facing diseases such as swine fever, the settlement mode often faces relatively higher risks due to its high industrial agglomeration and correlation, as well as environmental protection pressure.

4.3 Integration Mode: Muyuan Group

Under the integrated mode, Muyuan unified the construction of pig houses, investment in human feed and animal protection, concentrated on breeding pigs, breeding piglets, breeding finishing pigs, and finally unified sales to consumers. Through the integrated industrial chain, all links are controllable, and it has significant advantages in epidemic prevention, labor, management, etc., but in the early stage, it needs to invest a lot of money to build pig houses and equipment, and the expansion is slow, which is a typical "heavy asset model". Muyuan shares has also entered the era of intelligent breeding. The company said that it provided a high clean growing environment for pigs by developing intelligent equipment such as intelligent feeding, intelligent environmental control and pig breeding robots. The company also established a pig disease prediction model through artificial intelligence technology to realize real-time monitoring and effective control of epidemic diseases, automatic collection and analysis of breeding process data, early warning of some pig diseases, and assisted veterinarians in remote diagnosis, which greatly improved the artificial efficiency, and the production efficiency was higher than the average level of the domestic industry.

In the first half of 2021, Muyuan shares' net profit attributable to shareholders of listed companies is expected to be 11 billion to 11.5 billion yuan, a year-on-year decrease of 12.83% to 5.42%. Muyuan shares has become the most profitable pig enterprises that have disclosed performance forecasts. On April 29, Muyuan announced that its revenue in 2021 was 78.89 billion yuan, a year-on-year increase of 40.18%, but the net profit attributable to shareholders of listed companies was 6.904 billion yuan, a year-on-year decrease of 74.85%. In the context of the shrinkage of the national feed breeding industry, it seems to be a very few profitable enterprises.

Due to the unprecedented rise of pig prices in 2019, large-scale breeding enterprises have abundant cash flow, breeding enterprises accelerate the pace of expansion, projects under construction rise exponentially, leading enterprises continue to improve the level of large-scale breeding, and market competition continues to intensify. At the same time, the crazy expansion of the industry has also laid the groundwork for the overcapacity of pigs since the end of 2020. Most of the large-scale breeding enterprises returned their profits in the previous two years, and the cash flow of the industry tends to dry up. There is no final conclusion about when the pig industry will recover. Muyuan Co., Ltd. has been regarded by other peers in the industry as the direction of enterprise learning, but whether the loss will expand and continue to lose in the next second quarter is the most worrying problem for investors.

The biggest feature of the all self-breeding integration strategy is that it can continuously optimize and upgrade the standardized, large-scale and intelligent production equipment environment. Although these high-tech equipment will cause the proportion of fixed assets to be higher than that of their peers, and the annual depreciation cost is higher, on the whole, it greatly reduces the labor cost. The average labor cost of raising pigs in Muyuan is far lower than that of farmers and normal peers. At the same time, the automatic operation mode also reduces the possibility of human mobile transmission of the plague to a certain extent, provides a guarantee for the healthy growth of pigs, and reduces the direct loss when the epidemic occurs. In addition, large-scale and standardized breeding also provides a cost advantage for the market competition of Muyuan in terms of marginal cost. The unit breeding cost per kilogram is 15-20% lower than that of its peers, which is a very huge competitive strength.

In such a thriving business situation, the market also raised two questions about Muyuan. The most important question is the authenticity and credibility of the financial data disclosed by Muyuan shares. Although many securities companies disclose documents or data that can support their credibility, the public still doubts this in the face of tight market conditions. Another risk point is that Muyuan has expanded its production capacity too fast in recent years. In order to ensure large-scale competition, the intensive Muyuan needs to maintain a high scale for a long time to win market competitiveness, but the pig price has been running low for a continuous year, and continuous losses may lead to the rupture of the capital chain of Muyuan shares. For example, the commercial bill cashing event in November 2021 once pushed Muyuan shares to the forefront of the storm.

5 Discussion

These different models also involve varying degrees of integration between companies and rural areas, which plays an important role in local village goods inflows to the market. In the past 20 years, China's rural agricultural products market has begun to appear a national integration pattern, and local regional agricultural products market transactions have been integrated into the "market chain" of the national market system [11].

The research on market micro-structure in economics points out that there is a widespread phenomenon of middleman in the transaction of goods and services, and there are many types of intermediaries between buyers and sellers in the economic system [10]. This way of cooperation between the company and local SMEs and farmers is to reduce the middleman link, achieve the effect of de-intermediation, and bring greater convenience and higher profits to both sides.

However, it must be noted that in these cooperation, collectivized enterprise organizations are in a market monopoly position, while farmers and local SMEs are always in a weak position. Under the intensive mode, market transactions are mainly dominated and controlled by large enterprises, and it is difficult to really share the benefits brought by the structural form, that is, the profits of the secondary and tertiary industries generated by the appreciation of primary products.

The companies with the "company + farmer" mode is mainly responsible for breeding pigs and breeding piglets, providing piglets, feed, vaccines, veterinary drugs and technical personnel support for farmers. After the pigs reach the marketing weight, the company guarantees the price of the products and pays the farmers' surrogate breeding fees. The ownership of pigs is in the hands of the company throughout the whole process. Under this mode, the breeding scale is increased rapidly, the cost is relatively low, but the anti risk ability is weak.

From the perspective of national policies, food security has always been an important strategy in China. Since 2007, various subsidies and support policies for the breeding industry have been established to encourage enterprises and villagers to breed livestock and poultry. But in general, a large number of government support funds have flowed into group enterprises with strong technical strength, intended to play a leading role in "driving the local economy", but the subsidies actually entered local farmers are unequal. On the one hand, it can bring technical support and income guarantee for local people to get rich, but it often directly shows great performance differences in the face of market shocks.

However, "company + farmer" is still a transitional model. After 2015, the cost advantage of rural areas gradually withdrew from the historical stage. For example, with the increase of urban wages, farmers' entry into cities led to a significant increase in the opportunity cost of individual pig breeding, and the increase in rural land utilization led to an increase in land costs, while industrialization, standardization, refinement, and automated breeding did not slow down in the improvement of output efficiency. Therefore, In the future, industrial integrated breeding (self breeding) may gradually replace "companies + farmers" and become the mainstream of the times (As shown in the appendix).

Under the "integration" mode, enterprises build standardized breeding plants and hire breeding plant principals, technicians and breeding workers. Under this mode, the early investment of funds is high, the demand for land is large, and the depreciation is large, but the process is controllable and the ability to resist risks is strong. If the enterprise operates under high liabilities, it will face greater risks when facing risks [12].

6 Conclusion

In general, although the integration model represented by Muyuan group is difficult to expand rapidly due to the heavy asset model, the enterprise adheres to the concept of combining planting and breeding, takes the path of ecological agriculture, and implements unified management, which can ensure the quality of pigs and food safety, and meet the increasing attention of residents to food safety in the context of consumption upgrading; The advantage of the company + farmer mode represented by Wens group is that it reduces the investment of company funds and facilitates the expansion of enterprises. At the same time, the use of dry manure technology reduces pollution like pollutants and saves land. Under the current situation of tight land resources in China, it has high replicability.

Enterprises in the settlement mode can give full play to the geographical resource advantages, reflect the cost advantages, realize the agglomeration of industrial chains, and improve production efficiency, but at the same time, it also poses a huge challenge to the management ability. Each mode has its own unique advantages while having certain disadvantages.

7 Appendix: Comparison of three economic models

Mode	Company plus farmers	Settlement Mode	Integration Mode
Cooperation with local villagers or SMEs	Led by enterprises, combined with rural cooperatives and farmers, providing technical support and recycling products at guaranteed prices. It can effectively stimulate or guide local farmers to develop agricultural economy.	Systematically integrate local industrial chains, feed enterprises and related resources, cultivate contracted farmers in the base, build breeding and commercial pig breeding enterprises.	Under the integrated mode, the leading enterprises will build pig houses, invest talents, feed, equipment and animals, cultivate pigs, piglets and fattening pigs, and finally sell them to consumers.
Operating capital demand	The cost of equipment, site and feed borne by the enterprise is low. The main breeding costs are transferred to local farmers.	Based on regional advantages, outsourcing or subsidiary related businesses in the form of industrial alliance, and integrating regional industrial chain resources with considerable fixed investment.	The whole industry expansion investment from top to bottom has a high degree of autonomy, but it needs to invest considerable early-stage funds and operating costs.
Difficulty of management	Difficult to manage, supervise the process, and high possibilities of loopholes to occur.	Relatively easy to manage under the constraints of the system, but hard to supervise the correlation and interaction between sub-enterprises with independent accounting.	Centralized mode has a unified standard for the management of all business departments, and has higher executive power and supervision ability for the implementation of policies.
Quality control	Unstable quality, lack of standardized process and process supervision.	Relatively stable, but non standardized formula gives the product diversity and instability.	Stable quality and standardized production.
Production efficiency	Market factors are large, which can increase production rapidly in a good market, but the enthusiasm for production is low in a bad background.	Flexible and can actively make adjustments according to market changes.	Controlable, but the production capacity is limited and affected by the enterprise's capital and scale.
Policy support	Mainly supported by the government and can drive the development of regional agriculture.	Obtain corresponding project support in combination with specific local policies.	Fewer general industry policies, most are aimed at leading enterprises
Favorable market stage	Advantage to rapidly expand production capacity at low cost.	Can expand the business scale and territory by means of industrial alliance quickly.	The development and expansion are subjected to the amount of funds of enterprises.
Market tightening stage	Guaranteed repurchase makes enterprises bear greater market risks.	Due to the cooperative mode of joint system, the risk cost is shared and has acceptable anti risk ability, but it is often industrial to be impacted by the market.	The ability to resist risks is high, but it is also affected by liabilities and financing
Anti-risk ability	Low anti risk ability in the context of high contract.	The ability to resist risks is high and will be affected by regional industries.	Strong anti risk ability, high degree of disease prevention and control and cost control.

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