ANIMAL HUSBANDRY IN CHINA

TREND REPORT

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EXECUTIVE SUMMARY

China's animal husbandry industry plays a vital role in the nation's agricultural economy, contributing over 3.8 trillion DKK annually and accounting for approximately 35% of total agricultural output. As a leading global producer and consumer of meat products, China has witnessed significant growth in this sector. However, challenges such as antibiotic overuse, feed shortages, environmental concerns, and traceability issues continue to persist.

This report explores the current development status of animal husbandry in China, highlighting key business models, industry players, and government policies shaping the industry's future. The Chinese government has introduced several initiatives to promote sustainable and high-quality development, including stricter antibiotic regulations, enhanced feed production strategies, and advanced animal disease prevention measures. However, despite progress the industry faces pressing challenges, such as heavy reliance on imported feed ingredients, growing concerns over antibiotic resistance, and the need for improved traceability systems to ensure food safety. The report also examines the state of animal welfare and disease control, identifying opportunities for further advancements in farming practices and biosecurity measures.

China's push for modernization, combined with international collaboration and technological innovation, presents opportunities for the country to enhance its global competitiveness in animal husbandry. Moving forward, balancing economic growth with sustainability, environmental responsibility, and consumer health protection will be critical in shaping the industry's future.

If you are interested in learning more about China's agricultural policies and animal husbandry, please contact ICDK Shanghai.

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INTRODUCTION

Animal husbandry is an important part of China's agricultural sector, significantly impacting food security, rural development, and the overall economy. As one of the world's largest producers of livestock products, China has continually expanded its farming operations to meet the demands of its growing population. The industry has evolved rapidly, incorporating large-scale commercial farming, technological innovations, and government-backed sustainability initiatives.

The Chinese government has taken an active role in regulating and modernizing animal husbandry. Policies such as the National Action Plan for Reducing the Use of Veterinary Antimicrobials (2021-2025) and various agricultural reforms aim to address pressing issues, including excessive antibiotic use, disease control, and environmental impact. Despite these efforts, China faces substantial hurdles in ensuring the long-term sustainability of the sector. Antibiotic overuse has led to increased bacterial resistance, while feed production is hindered by the country's dependency on imported raw materials. Additionally, concerns over food safety and product traceability remain significant challenges (The State Council The People's Republic of China, 2021).

This report provides a comprehensive analysis of China's animal husbandry industry, examining its current state, key business models, major industry players, and regulatory framework. Furthermore, it explores the challenges and opportunities within critical areas such as antibiotic use, feed production, traceability, animal welfare, and disease control. The findings offer insights into potential strategies for improving the industry's sustainability and ensuring the safety and quality of livestock products for both domestic and international markets.

I. CURRENT DEVELOPMENT STATUS OF ANIMAL HUSBANDRY IN CHINA

In 2020, the General Office of the State Council issued the *Opinions of the General Office of the State Council on Promoting the High-quality Development of Animal Husbandry*, emphasizing the need to promote circular development of agriculture and animal husbandry and strengthen overall planning of agriculture and animal husbandry (The State Council The People's Republic of China, 2020). The *National Action Plan for Reducing the Use of Veterinary Antimicrobials (2021 - 2025)* formulated by the Ministry of Agriculture and Rural Affairs is based on the reality of animal husbandry, and in accordance with the requirements of optimizing regional layout and product structure, it has refined and clarified the regional layout of six key industries, including live pigs, poultry, dairy animals, beef cattle and sheep, characteristic livestock and poultry, and forage. Combining the advantages and characteristics of different regions, specific development requirements and measures have been proposed to promote the construction of a modern breeding system, and the green and circular development of animal husbandry (The State Council The People's Republic of China, 2021).

In 2022, the national output value of animal husbandry exceeded 3.8 trillion DKK, accounting for about 35% of China's total agricultural output value. While making progress, the fact that there is still a significant gap between China's animal husbandry industry and developed countries indirectly indicates that the development prospects of China's animal husbandry industry are still quite broad. How to promote the sustainable development of animal husbandry has become an important issue affecting the level of agricultural economic development, social stability, and the development of the national economy.

1.1 Overview of the Development of Animal Husbandry in China

China is a major producer and consumer of meat products worldwide, with per capita meat consumption rapidly increasing from 9 kilograms per year in 1978 to 70 kilograms per year in 2022. 1.4 billion Chinese people eat approximately 700 million pigs, 50 million cows, 300 million sheep, and 16 billion poultry per year. In recent years, the production of major livestock products in China has shown an overall upward trend. In 2022, the national production of pigs, cattle, sheep, and poultry meat reached 92.27 million tons, an increase of 3.39 million tons or

3.8% compared to the previous year, the highest in nearly six years, breaking through 90 million tons for the first time. Among them, the overall production of live pigs is stable, and the production of beef, mutton, and poultry meat continues to increase (National Bureau of Statistics, 2025).

	Pig		Cattle		Sheep		Poultry			
	10000 head	**10000 tons**	**10000 head**	**10000 tons**	**10000 tons** (milk)	**10000 head**	**10000 tons**	**One hundred million**	**10000 tons**	**10000 tons** (egg)
2016	68502	5426	--	617	3064	--	460	124	2002	3161
2017	68861	5452	4340	635	3039	31213	471	130	1982	3096
2018	69382	5404	4397	644	3075	31000	475	131	1994	3128
2019	54419	4255	4533	677	3201	31699	488	146	2239	3309
2020	52704	4113	4565	672	3440	31941	492	156	2361	3468
2021	67128	5296	4707	698	3683	33045	514	157	2380	3409
2022	69995	5541	4804	718	3932	33624	525	161	2443	3456

Table 1: China's Animal Husbandry Production from 2016 to 2022 (National Bureau of Statistics, 2025)

1.2 Major Listed Companies in the Industry

As of December 2023, there are 50 major listed companies in China's animal husbandry industry, with industry leaders mainly including Wens Food Group Co., Ltd, Muyuan Food Co., Ltd, New Hope Group Co., Ltd, Haid Group Co., Ltd, etc. Table 1.2 shows the basic information of the top ten listed companies in China's animal husbandry industry, ranked by market value.

Name	**Stock code**	**Market value** (100 million yuan)	**Revenue (profit)** (100 million yuan)	**Business profile**
Muyuan Food Co., Ltd	002714	2189	1248（132）	A comprehensive modern enterprise group that integrates feed processing, pig breeding, pig farming, slaughter and processing
Wens Food Group Co., Ltd	300498	1296	837（52）	business focuses on the breeding, processing, and sales of pigs, chickens, ducks, milk, eggs, pigeons, etc.
Shuanghui Group Co., Ltd	000895	886	626（71）	The leading industries include feed, animal husbandry, slaughtering, meat product processing, new material packaging, cold chain logistics, and chain commerce.
Haid Group Co., Ltd	002311	704	1047（29）	The main business covers feed, seedlings, animal protection vaccines, smart farming, food processing, etc.
New Hope Group Co., Ltd	000876	430	1415（-14）	The business involves the entire industry chain of feed, aquaculture,

				meat products, and financial investment
Dabei nong Technology Group Co., Ltd	002385	277	324（0.55）	Agricultural enterprise groups with feed and seed industry as the main body, supplemented by animal protection, plant protection, vaccines, pig breeding, and biological feed
Sunner Food Co., Ltd	002299	218	168（4.1）	A white feather broiler enterprise that integrates independent breeding, chicken breeding, egg hatching, feed processing, broiler breeding, broiler processing, food deep processing, and product sales.
Juxing nong mu Co., Ltd	603477	188	40（1.6）	Pig farming and sales, feed production and sales, mid to high end leather manufacturing and sales
Lihua mu ye Co., Ltd	300761	158	144（8.9）	Business covers poultry breeding, incubation, ecological breeding, feed processing, meat processing, and poultry disease technology research
New Wellful CO.LTD	600975	156	49、（-0.79）	An outward oriented listed company with pig farming and export as its main business

Table 2: Overview of Major Listed Companies in Animal Husbandry

1.3 Main Business Management Models of Animal Husbandry

1.3.1 Company and farmer model

This model involves the company supplying production materials such as piglets, feed, and veterinary drugs to farmers, and ultimately achieving unified product repurchase by the company. The company also provides unified technical and management standards, including immunization procedures, health care procedures, etc. Management standards refer to the feeding plans for various stages of animals. Farmers use their own land, rooms, and production tools to cultivate their own livestock, and the relationship between farmers and companies is only a simple supply and marketing cooperation. Currently, it is widely believed that this model can drive farmers to become rich. For companies, occupying less land, investing in fixed assets is small, and the speed of enterprise expansion is fast. However, there are significant risks in livestock management and disease control, along with serious environmental concerns and breach of contract issues among cooperative farmers. Farmer abandonment of livestock leads to a higher risk for the company in terms of animal repurchase and credit recovery. In addition, farmers conduct breeding activities within their respective farms, and enterprises have limited control over them. Due to the pursuit of profit maximization, farmers may inevitably use feed and drugs obtained through other channels, potentially leading to a decline in the quality of the products.

1.3.2 Company, base and farmer model

The business and production model of "company, base and farmers" is essentially "company and farmers", but the difference lies in the fact that enterprises invest in and build breeding plants according to unified standards, and provide farmers with animal offspring, feed, veterinary medicine, technical guidance and technical personnel services, as well as epidemic prevention and technical management. Farmers pay appropriate deposit and then engage in closed aquaculture in the base, becoming contracted farmers of the company, The company is ultimately responsible for repurchase and sales. The advantage of the "company, base and farmers " model is that it reduces the risk of feeding management and diseases during the fattening stage, and reduces the risk of repurchasing fattening pigs (cattle, sheep, poultry) and fund recovery. However, as asset investment increases, land occupation increases, and expansion speed slows down, the pressure on centralized environmental protection treatment increases.

1.3.3 Self-breeding, self-raising, and self-processing mode

The integrated model of "self-breeding, self-raising, and self-processing" forms a complete closed industrial chain that integrates breeding, propagation, and feeding. The construction, feeding, and fixed equipment of the breeding plant are all invested by the enterprise. The company conducts unified breeding, provides unified feeding, implements unified epidemic prevention, and carries out unified sales. After farmers sign a contract with the company to establish an employment relationship, they are in an employment relationship with the company. This model can strictly control the production process and adopt more scientific and advanced feeding methods. Under this model, management and disease risk are minimized, and food safety is guaranteed. But the company has a large fixed asset investment and environmental pressure.

II. CHALLENGES AND OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT OF CHINA'S ANIMAL HUSBANDRY

The use of antibiotics, feed quality, and traceability systems for livestock products are closely related to the sustainable development of animal husbandry. The rational use of antibiotics is key to ensuring the health of

livestock and poultry, and avoiding the potential impact of antibiotic abuse on the environment and human health. The provision of high-quality feed not only helps the growth of livestock and poultry, but also reduces resource waste and environmental burden. Establishing a comprehensive traceability system for animal husbandry products helps to ensure product quality and safety, and improve the overall reputation of the animal husbandry industry. The synergistic effect of these factors helps to achieve sustainable development of animal husbandry, promote effective utilization of resources, environmental protection, and balance economic benefits.

2.1 Challenges and Opportunities Faced by the Use of Antibiotics in China's Animal Husbandry Industry

2.1.1 Current situation of antibiotic use in China

China is the world's largest producer and consumer of antibiotics. As a major producer and user of antibiotics, China's consumption in 2022 is 150 times that of the UK, the per capita usage is 10 times that of the US, and 6-10 times that of European countries. In 2020, China's antibiotic production reached 223000 tons, a year-on-year increase of 2.26%, and the market size exceeded 169.7 billion DKK. The expenditure on antibiotics in animal husbandry in China accounts for 70% to 80% of the total expenditure on drugs in the animal husbandry industry, accounting for about 50% of the total domestic production of antibiotics. Animal husbandry is a heavily affected area of antibiotic abuse. With the long-term use and abuse of antibiotics, antibiotics not only remain in meat products and feces, affecting animal production and ecological environment, but also transmit through the food

chain, causing human resistance to antibiotics and threatening human health (Yu, Rajasekar, & Zhang, 2023).

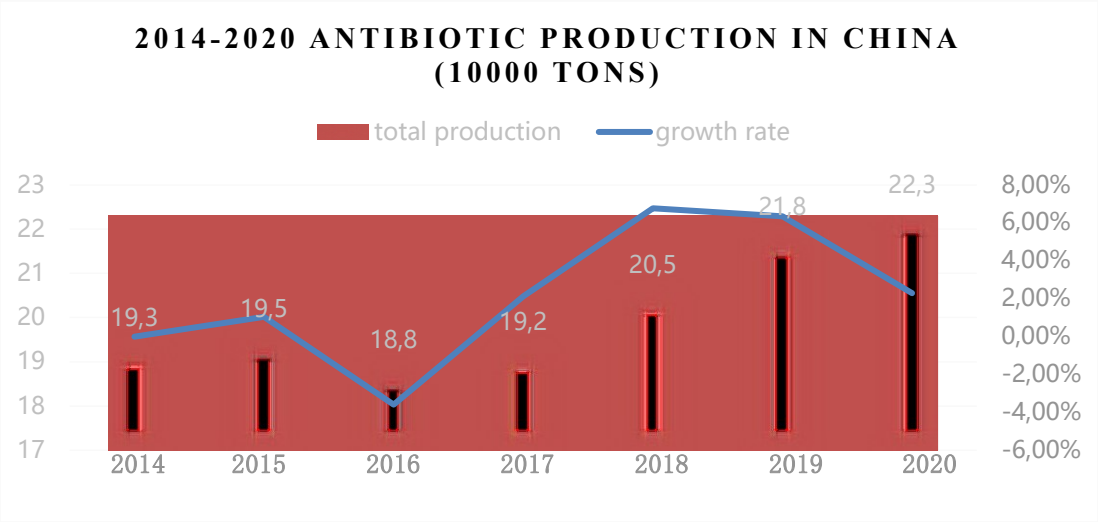

Figure 1: Antibiotic Production in China from 2014 to 2020 (Yu, Rajasekar, & Zhang, 2023)

2.1.2 Antibiotic policies in China's animal husbandry industry

To ensure the standardized use of antibiotics and ensure the safety of livestock and poultry products. In 2001, Announcement No. 168 《Norms for the Use of Feed Additives》 was issued to regulate the use of antibiotics in feed. In 2002, Announcement No. 193 《List of Veterinary Drugs and Other Compounds Prohibited for Food Animals》 was issued to standardize the guidelines and scope of use of veterinary antibiotics. In 2015, the Ministry of Agriculture issued Announcement No. 2292, stating the cessation of the use of four veterinary drugs, including ofloxacin, norfloxacin, lomefloxacin, and pefloxacin, in food animals. In 2018, Announcement No. 2638 was issued, which added the following content: "Stop the use of three veterinary drugs, including Olaquindox, Arsanilic acid, and Roxarsone, in food animals". In 2020, the Ministry of Agriculture issued Announcement No. 194, which stated that antibiotics should be completely banned in Chinese feed allowing them to be used for treatment to reduce the harm caused by antibiotic abuse and maintain the safety of animal derived food and public health in China (The State Council The People's Republic of China, 2021).

2.1.3 Harms caused by antibiotic abuse in animal husbandry

Environmental pollution issues

After antibiotics are used in animal bodies, only a small portion of the antibiotics will be absorbed by the animals. 30% to 90% of the antibiotic content will be excreted from the body with its metabolites such as feces and urine. When the antibiotic content in the animal body exceeds the limit, it will enter the soil and water with the above metabolites. Due to its stable nature and not easy to decompose, it will have side effects on the growth and development of microorganisms, animals and plants in the environment, Increase the resistance of native microorganisms. Thus, endangering human health. The detection rate of Oxytetracycline, Tetracycline, and chlortetracycline in the surface soil of farmland using animal manure was 93%, 88%, and 93%, respectively (Institute of Animal Sciences of CAAS, 2023).

Harm to humans and animals

Residual and excessive antibiotics exist in animal bodies and their products. After consumption, humans gradually accumulate them in the body. As the accumulation increases, human organs undergo lesions, and in severe cases, allergic reactions, distortions, and carcinogenesis may occur; After long-term consumption of animal-based foods containing excessive antibiotics, people may experience chronic poisoning, leading to diseases such as skin itching and urticaria.

2.1.4 Opportunities in the antibiotic industry

Still occupying an important position for a long time

Against the backdrop of the national governance of antibiotic abuse, the growth rate of China's anti-infective drug market has slowed down, but as a fundamental drug, the market size of anti-infective drugs remains large. The global demand for antibiotics is expected to grow at an average annual rate of 4.5% in the next five years, with China accounting for 42.4% of the global antibiotic export market in 2021, ranking first in the world (Yang, Lewis, & Yangmu, 2024).

Technological upgrading has become a key focus

According to the *National Action Plan for Combating Microbial Drug Resistance (2022 - 2025)* released by the

National Health Commission, China will carry out research and development, transformation and application of new antimicrobial drugs, diagnostic tools, vaccines, and alternative antimicrobial drugs. Develop rapid diagnostic devices and reagents for drug-resistant bacterial infections, support the development of cost-effective and easy-to-implement drug concentration monitoring technologies. China will focus on strengthening the research and development of antibiotics suitable for special populations such as pregnant women, children, and the elderly, and further strengthen the research and development of alternative antibiotics such as plant extracts. Promote the research and development of animal specific antibiotics and alternatives to veterinary antibiotics (The State Council The People's Republic of China, u.d.).

International cooperation is a trend

The National Health Commission has clearly stated that in the formulation of prevention and control strategies and technical standards, monitoring and evaluation, research and development, technology promotion, talent cultivation, and thematic seminars, it will promote bilateral and multilateral scientific and technological cooperation with other countries. Key efforts will be made to promote international cooperation in antimicrobial resistance monitoring, control of the cross-regional and cross-border transmission of drug-resistant bacteria, and other related activities.

2.2 Challenges and Opportunities Faced by China's Feed Industry

2.2.1 Overall status of feed in China

The overall feed production in China has maintained a stable growth trend, with the industry scale ranking first in the world. From 2018 to 2022, China's feed production increased from 228 million tons to 302 million tons, an increase of 74 million tons over five years, with a compound annual growth rate of 5.81%. Among them, the national production of compound feed in 2022 was 28.021 million tons, a year-on-year increase of 3.7%, accounting for 92.71% of the total feed production, an increase of 0.64 percentage points compared to the previous year; The national concentrated feed production was 14.262 million tons, a year-on-year decrease of 8.05%, accounting for 4.72% of the total feed production, a decrease of 0.57 percentage points from 2021.Overall, China's feed is mainly composed of compound feed, and the scale of compound feed products is constantly

expanding.

	Pig feed	Poultry feed (Egg)	Poultry feed (Chicken)	Ruminant feed	Aquatic feed	Pet Feed	Other	Total
2022	13597.5	3210.9	8925.4	1616.8	2525.7	123.7	200	30200
2021	13076.5	3231.4	8909.6	1480.3	2293.0	113.0	240.5	29344.3
2020	8922.5	3351.9	9175.8	1318.8	2123.6	96.3	287.2	25276.1
2019	7663.2	3116.6	8464.8	1108.9	2202.9	87.1	241.9	22885.4
2018	9720	2984	6509	1004	2211	--	360	22788

Table 3: China's Feed Production from 2018 to 2022 (10000 tons) (China Feed Industry Association, 2025)

2.2.2 Current situation of feed additives in China

From 2018 to 2021, the total production of feed additives in China increased from 10.94 million tons to 14.775 million tons, with an average annual growth rate of 8.8%. The production of single feed additives increased from 10.35 million tons to 13.68 million tons, with an average annual growth rate of about 8%. The production of mixed feed additives has increased from 590000 tons to 1.096 million tons, with an average annual growth rate of about 21%. Amino acids increased from 2.85 million tons to 4.255 million tons, with an average annual growth rate of about 12%. The number of vitamins increased from 1.27 million tons (2019) to 1.773 million tons, with an average annual growth rate of about 13%. The production of mineral elements increased from 5.67 million tons to 6.926 million tons (2020), with an average annual growth rate of about 7.4%. The production of enzyme preparations and microbial preparations has increased rapidly, with an average annual growth rate of 20% and 24%, respectively.

		2021	2020	2019	2018
Total		1477.5	1390.8	1199.2	1094
Single feed additives		1367.9	1296.4	1130.2	1035
Mixed feed additives		109.6	94.4	69	59
Contain	amino acid	425.5	369.7	330	285
	vitamin	177.3	160.3	127	--
	Mineral elements	--	692.6	590	567
	enzymic preparations	27.1	22.8	19.8	17
	Microbial preparations	25.8	22	17.9	15

Table 4: Production situation of feed additives in China from 2018 to 2021 (10000 tons) (China Feed Industry Association, 2025)

2.2.3 Challenges faced by China's feed industry

The domestic supply of feed raw materials is insufficient

The main feed formula in China still uses "corn-soybean meal" as the main ingredient. China's feed production is constantly increasing, and the demand for raw materials such as soybean meal and corn is also constantly increasing. Especially soybean meal mainly relies on imports from countries such as the United States and Brazil, with an import dependency of 75%. The shortage of feed resources directly leads to high production costs in the animal husbandry industry. In 2023, the cost of feed for pig farming in China is about 818 DKK yuan per head, which is 4.5 times that of the United States; The production cost of raw milk in China is 3.14 DKK per kilogram, while the cost per kilogram in New Zealand and Australia is 1.32 to 1.52 DKK, the cost in the United States is 1.62 to 1.80 DKK, and the cost in the European Union is 1.80 to 1.99 DKK (China Agriculturl University, u.d.).

The quality and safety issues of feed are prominent

Due to the short development time of the feed industry, the quality and safety supervision system is not yet sound, resulting in unreasonable management connections and inadequate service supervision. This has led to prominent feed quality and safety issues in China. The main manifestation is that enterprises or breeders use prohibited drugs in feed products; Not following regulations when using feed drug additives; Abuse of trace element additives; Adding and using prohibited animal feed to ruminant animal feed; Improper labeling of feed labels; The phenomenon of producing and selling counterfeit and inferior products frequently occurs.

Lack of strong technological innovation ability

The new technologies and products applied in feed industrialization are mainly introduced and imitated, with a lack of original technologies and products. The problem of low-level homogenization competition in the market is prominent, and there are not many enterprises and brands with strong international influence. The feed industry belongs to a low profit industry, and the lower return rate restricts the level of innovation and research and development investment of enterprises. The R&D investment expenses of most listed feed enterprises account for less than 3% of sales revenue. In addition, the long-term lack of financial investment in feed research has led to weak basic research capabilities and insufficient innovation momentum in the feed industry (The National Animal Husbandry Station, 2025).

2.2.4 Opportunities in China's feed industry

According to the *Opinions on Promoting High Quality Development of Animal Husbandry* issued by the General Office of the State Council and the *National Development Plan for Animal Husbandry and Veterinary Industry (2021-2025)* issued by the Ministry of Agriculture and Rural Affairs , efforts will be made to accelerate the research and development, promotion, and application of bio feed, safe and efficient feed additives, and other additives (The People's Republic of China, 2025).

New types of feed additives

Primarily including enzyme preparations, probiotics, plant extracts, and other green, safe, and efficient feed additives, are beneficial to both animals and humans. They leave no residue, do not induce resistance, and are safe for both humans and animals. With rapid market development, they have become the most promising branch in the feed additives industry. Therefore, the application prospects of new types of feed additives will be very broad.

Key technology promotion and application

Promote precise feed formulation technology, efficient low protein feed formulation technology, green new feed additive application technology, and efficient utilization technology of non-grain feed resources. Promote the reduction and substitution of corn and soybean meal. Increase the cultivation of whole plant silage corn, improve the self-sufficiency rate of scarce forage such as alfalfa and oat grass, develop and utilize new forage resources, and promote the efficient utilization of non-grain feed resources. Increase efforts in the selection and promotion of excellent forage varieties, support the construction of forage breeding bases, and enhance the ability of forage seed production and propagation.

2.3 Challenges and Opportunities Faced by the Animal Husbandry Product Traceability Industry

2.3.1 Current status of animal husbandry product traceability system

At present, China's agricultural product tracking system is still a public regulatory system led by government departments and relying on government promotion. The Chinese food traceability system includes three levels.

Government led agricultural product tracking system, social organization led agricultural product tracking system, and enterprise led construction of agricultural product tracking public service platform. According to data from the Ministry of Commerce, since 2010, after the pilot construction of a meat vegetable circulation traceability system was implemented in ten cities including Shanghai and Nanjing, 58 pilot cities in China have basically established a meat vegetable circulation traceability system, forming a preliminary meat vegetable circulation traceability network that is suitable for the large market and circulation of the whole country. The Pilot projects for the first, second, and third batches were carried out in 35 cities, including 402 designated pig slaughtering enterprises, 350 large-scale agricultural product wholesale markets, 6390 standardized vegetable markets, 3432 large and medium-sized chain supermarkets, and 7080 group consumption units, covering a total of 17655 enterprises. More than 85% of the pilot areas have completed integration with the central platform, covering over 300,000 operating merchants, thus establishing a preliminary nationwide and urban-rural interconnected information traceability system (Ministry of Commerce, 2025).

2.3.2 Challenges faced by animal husbandry product traceability

Through the organization of food traceability issues by China Food and Drug Administration, Beijing Academy of Agriculture and Forestry Sciences, China Food News Network and other units (Berti, 2018), the main problems faced by China's animal husbandry product traceability are as follows:

The technology application is not mature, making it difficult to achieve widespread technology popularization

At present, it is widely known that the technologies applied to the traceability of agricultural product quality and safety mainly include radio frequency identification (RFID) technology, QR code technology, iris recognition technology, carcass labeling and coding technology, and blockchain technology. However, there is still great room for improvement in the operation and popularization of these traceable technologies. For example, although RFID technology can track, trace, and manage the relevant attributes of products at any time, it cannot guarantee privacy protection issues during the tracking process and has high usage costs；Although QR code technology is efficient and cost-effective, it has poor information confidentiality and is easy to change, making it difficult for the public to distinguish the authenticity of food testing reports；Carcass labeling and encoding technology, as well as iris recognition technology, have high technological content and are difficult to popularize.

The traceability system lacks integration and compatibility

A traceability system is a very complex system that involves multiple links such as breeding, processing, storage, and sales. Overall, the phenomenon of national, local, enterprise, and group levels of food safety traceability systems being "independent", "segmented supervision", and "unable to connect with each other" is relatively serious. Firstly, it has increased the development cost of the food safety traceability system, resulting in a large number of "information silos" and "data garbage", leading to serious resource allocation losses and waste, making it difficult to generate economies of scale. secondly, a company needs to be included in multiple traceability systems. After products flow from a certain regulatory warehouse to another location, they need to re-enter the new regulatory warehouse for repeated reporting, testing, disinfection, and coding. The repetitive work elongates the product circulation process and increases the company's operating costs. Thirdly, the segmented supervision restricts the functionality of the traceability system, greatly reducing its performance and value, resulting in a gap in food safety supervision and potential food contamination hazards.

Traceable legislation is not systematized

At present, there are problems with the food safety traceability system, such as incomplete and slow development of laws and regulations, narrow coverage and inconsistent standards for different types of food, failure to elevate various strengthening measures to the level of legal system construction, and lack of strong punishment measures. For example, the Food Safety Law did not officially incorporate food safety traceability into laws and regulations until 2015, but there is still a lack of clear requirements on how to establish a traceability system. Local laws and regulations also have relatively one-sided and vague requirements for food safety traceability (The State Council of the People’s Republic of China, 2019) .

2.3.3 Opportunities in the food safety traceability industry

China will promote the integration of agricultural product traceability information into various stages before, during, and after production, and extend the construction of full traceability to the market circulation and consumer end. While carrying out pilot projects for the traceability system of meat (vegetable) circulation, China will vigorously develop chain operations and logistics distribution, cold chain technology, and strengthen packaging

management to improve the modernization and standardization level of meat and vegetable circulation.

The new version of the Food Safety Law in 2015 clearly defined the establishment of a comprehensive traceability system for food safety by the country, and thus the Chinese food safety traceability industry entered a stage of rapid development. In 2022, the scale of China's food traceability industry will exceed 97.96 billion DKK, and the demand for food traceability will maintain a growth rate of over 15% in the coming years. In 2014, the market size of China's food traceability industry was only 439 million (Yang, Lewis, & Yangmu, 2024)

III. ANIMAL WELFARE AND DISEASE PREVENTION AND CONTROL IN CHINA

3.1 Animal Welfare

The currently internationally recognized animal welfare is the "Five Basic Principles" stipulated in the *Terrestrial Animal Health Code*. That is providing fresh water and food to ensure the health and vitality of animals, and protecting them from hunger and thirst; Provide an appropriate environment, including accommodation and comfortable habitats, to protect animals from discomfort; prevent diseases effectively and promptly diagnose and treat sick animals, ensuring they are spared from pain, harm, and illness；provide sufficient space, appropriate facilities, and conspecific companionship to allow animals to express normal behaviors freely；ensure that the conditions provided and the methods of handling avoid mental distress for animals, sparing them from fear and suffering. As a member country of the World Organization for Animal Health (OIE), the Chinese government acknowledges and supports the various animal welfare standards established by the OIE (World Organisation for Animal Health, 2025).

3.1.1 Current situation of animal welfare in China

The International Cooperation on Animal Welfare Branch of the China Association for International Cooperation in Agriculture (ICCAW) is a social organization approved by the Ministry of Agriculture in China that specializes in promoting animal welfare. The main contents of the *Development Report on Farm Animal Welfare in China 2013 - 2022* released by the ICCAW in 2023 are as follows:

With the joint efforts of the World Organization for Farm Animal Welfare and ICCAW, as of 2022, a total of 24 products from 20 Chinese companies have been included in the national animal welfare product list. Among them, the product types involve pork (4 pieces), beef (2 pieces), lamb (3 pieces), eggs (8 pieces), and chicken (7 pieces). Compared to 2019, the cumulative number of enterprises has increased by 566.67%, and the cumulative number of products has increased by 500%. The total number of beneficial animals has exceeded 890 million (Cui, Tang, Deng, & Jiang, 2023).

year	Beneficial animal species				
	chicken	cattle	sheep	Pig	Total
2019	3004	0	0	7	3011
2020	3017.2	1.2	0	9	3027.4
2021	41498.2	1.2	0.66	9	41509.06
2022	41535.2	1.3	2.46	15	41553.96
Total	89054.6	3.7	3.12	40	89101.42

Table 5: Number of animals in China that benefit from improved welfare practices (Unit: 10000)

3.1.2 Main practices of animal welfare in China

The animal welfare work carried out by pig breeding enterprises mainly focuses on improving the growth environment of pigs by adopting welfare breeding techniques such as sow herd breeding, piglet non cutting teeth, piglet non cutting tail, and increasing environmental richness. Poultry farming enterprises mainly carry out animal welfare work, including:

1. Chicken breeding enterprises mainly improve the welfare of broiler chickens from six aspects: setting reasonable feeding density, improving environmental quality, providing environmentally rich materials, monitoring the walking ability of broiler chickens, cultivating high-quality broiler chicken breeds, and humane slaughter.
2. Egg-laying chicken farming enterprises are actively exploring new welfare farming models such as non-cage rearing, and some companies have started implementing practices like not cutting off the chicken beak and retaining male chicks for meat production to improve welfare standards.
3. The animal welfare work of waterfowl breeding enterprises mainly focuses on three aspects: reducing forced feeding, improving the breeding environment, and humane slaughter.

The animal welfare work carried out by cattle and sheep breeding enterprises mainly includes:

1. Beef cattle and sheep: Breeding enterprises mainly improve the welfare of beef cattle and sheep by setting reasonable feeding density, providing sufficient sports venues, and providing environmentally rich materials.

2. Cows: Farming enterprises mainly improve the welfare level of cows by strengthening disease prevention and treatment, reducing the occurrence of diseases such as mastitis and lameness, improving the breeding environment.
3. Cashmere goats: Breeding enterprises mainly focus on improving the breeding environment and providing humane cashmere retrieval.

3.1.3 Challenges facing animal welfare in China

Practical application issues. The practical application gap of farm animal welfare is mainly reflected in two aspects: the breeding mode and insufficient training of breeding personnel.

1. in terms of animal husbandry models on farms, the current focus is on pursuing large-scale and intensive farming, and there is still a certain gap compared to the internationally advocated welfare farming methods.
2. in terms of training for breeding personnel, there is a lack of specialized training in breeding techniques and related animal behavior knowledge. There is a lack of animal welfare related courses and training offered by domestic universities and research institutions, as well as research applied to animal welfare practices, resulting in a lack of theoretical guidance and practical application in animal behavior, growth environment improvement, and other aspects.

Theoretical and technical level issues. On the one hand, the expert team of research institutions related to animal welfare in Chinese farms focuses more on nutrition, breeding, environment, behavior, diseases, and improving production efficiency, with less emphasis on interdisciplinary research in the field of animal welfare. On the other hand, China's welfare farming model lacks technology and cannot fully apply welfare farming technology to improve animal welfare levels.

Legal and Regulatory Issues

Currently, China lacks a specialized and comprehensive law specifically addressing animal protection. The most well-known "Wildlife Protection Law" primarily focuses on the conservation and rescue of precious and endangered wildlife, with little mention of the rights of ordinary animals. The first farm animal welfare industry

standard in China in 2017, the General Principles for Animal Welfare Evaluation, passed the expert review of the National Livestock Standardization Technical Committee, but this standard does not have legal effect (Wildlife Protection Law of the People's Republic of China, 2017).

3.2 Animal Disease Prevention and Control

3.2.1 Category of animal diseases

According to Article 4 of the Animal Epidemic Prevention Law, based on the degree of harm of animal diseases to animal husbandry production and human health, animal diseases stipulated in this law are divided into the following three categories (Standing Committee of the 13th National People's Congress of the People's Republic of China, 2021):

Class I diseases: including foot-and-mouth disease, African swine fever, highly pathogenic avian influenza, and other diseases that pose particularly serious threats to humans and animals, may cause significant economic losses and social impacts, and require urgent, strict mandatory prevention, and control measures.

Class II diseases: including rabies, brucellosis, grass carp hemorrhagic disease, and other diseases that pose serious threats to humans and animals, may cause significant economic losses and social impacts, and require strict prevention and control measures.

Class III diseases: including colibacillosis, avian tuberculosis, and other common and recurrent diseases that pose hazards to humans and animals, may cause certain economic losses and social impacts, and require timely prevention and control measures.

3.2.2 Current situation of animal disease monitoring

In 2021, China conducted monitoring for animal diseases with 339.985 million samples, including 11.5325 million samples for immune antibodies, 15.5972 million samples for infection antibodies, and 6.8688 million samples for pathogen detection. A total of 102 animal diseases were identified, including 8 Class I diseases, 52 Class II diseases,

34 Class III diseases, and 8 other diseases. The case fatality rate was approximately 21% for pigs, 13% for poultry, 12% for cattle, and 8% for sheep.

	Number of disease types	Number of sick animals (10000)	Number of deaths (10000)
Pig	29	76.04	16.08
Poultry	27	295.15	37.55
Cattle	26	1.89	0.22
Sheep	20	6.15	0.5
Other	20	2.65	0.98
Total	102	372.9	55.34

Table 6: Statistics on the number of animal disease reports in 2021 (The People's Republic of China, 2025)

3.2.3 Monitoring methods for animal diseases

According to the *National Animal Disease Surveillance and Epidemiological Investigation Plan (2021-2025)* released by the Ministry of Agriculture and Rural Affairs (The People's Republic of China, 2025), and the *Implementation Opinions on National Animal Disease Surveillance in 2023* formulated by the China Animal Disease Prevention and Control Center (People's Republic of China, u.d.), China has developed detailed monitoring plans and special investigation plans for 32 majors. For example, monitoring of African swine fever, foot-and-mouth disease, brucellosis etc. Using African swine fever monitoring as an example, the main practices are as follows:

***Testing time*:** According to the annual monitoring plans established by various regions.

***Testing methods*:** Pathogen detection includes polymerase chain reaction (PCR), real-time fluorescent PCR, nucleic acid isothermal PCR (LAMP), or test strips; serological detection includes competitive enzyme-linked immunosorbent assay (ELISA) or indirect ELISA methods.

***Criteria for judgment*:** For monitored positive individuals, PCR or real-time fluorescent PCR testing is conducted, with positive results; for confirmed positive individuals, monitored positive individuals are confirmed positive by provincial-level animal disease prevention and control institutions; for confirmed positive groups, at least one confirmed positive individual is detected within the group.

3.2.4 Opportunities in the field of animal disease prevention and control

According to the *Comprehensive Research and Application Plan for Key Technologies in the Prevention and Control*

of Animal Diseases released by the Ministry of Science and Technology in 2021 (Ministry of Science and Technology of the Peoples's Republic of China, 2025), the key research directions for animal disease prevention and control in China in the future are as follows:

Development of key technologies for the prevention and control of major exotic animal diseases

This involves the development and stockpiling of detection, monitoring, early warning, vaccines, drugs, and therapeutic antibodies for diseases such as African swine fever, Rift Valley fever, Nipah virus, West Nile fever, and bovine spongiform encephalopathy, which pose potential risks of introduction.

Research and development of new diagnostic technologies and products for important livestock diseases

For cattle nodular skin disease, brucellosis, tuberculosis, viral diarrhea, bovine leukemia, equine influenza and other important diseases of herbivorous livestock, explore specific diagnostic marks, develop visual detection technologies and products suitable for on-site quick inspection, high specificity detection technologies and products for laboratory diagnosis, and differential diagnosis technologies and products.

Develop high-throughput detection technologies and products for serological, pathogen detection, and immune efficacy evaluation.

CONCLUSION

The future of China's animal husbandry industry lies in its ability to balance economic growth with sustainability, food safety, and environmental responsibility. Though significant strides have been made in modernizing farming practices, improving regulatory frameworks, and increasing production efficiency, numerous key challenges remain. Antibiotic resistance is a growing concern, with widespread antibiotic use in livestock farming contributing to the rise of resistant bacterial strains. The government has implemented stricter regulations on antibiotic use, but further research and technological advancements are needed to develop effective alternatives. Similarly, the heavy reliance on imported feed ingredients, particularly soybean meal and corn, poses risks to the industry's stability. Strengthening domestic feed production through alternative protein sources and innovative feed additives could help mitigate these challenges.

Traceability remains another critical issue, as the complexity of China's supply chain makes it difficult to track the origins of livestock products. Enhanced digital tracking systems, blockchain technology, and government-led standardization efforts will be essential in ensuring food safety and restoring consumer confidence. Animal welfare and disease prevention are also at the forefront of industry discussions. While China has made notable progress in implementing welfare standards and monitoring animal diseases, there is still room for improvement. Increased investment in research, stronger enforcement of welfare regulations, and better training for farmers can help elevate industry standards.

Looking ahead, the success of China's animal husbandry industry will depend on continued government support, international cooperation, and the adoption of sustainable and innovative farming techniques. By addressing existing challenges and leveraging new opportunities, China has the potential to enhance the resilience and global competitiveness of its livestock sector while ensuring long-term food security and environmental sustainability.

LIST OF FIGURES

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