

## CHINA

## Domestic feed additives replacing antibiotics

By LI LEI  
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A range of homegrown gut health solutions for swine and poultry have passed rigorous approval processes by agriculture authorities and hit the domestic market in recent months, providing a boon to livestock farmers as they attempt to shift away from now-banned antibiotic growth promoters.

Experts said the approval reflects a growing need for organic feed additives, which have not only antimicrobial properties and other functions such as anti-inflammation and anti-oxidization, but are also safe for humans, animals and the environment.

One such product — developed by two biotech companies in Wuhan, Hubei province and featuring the butyric acid derivative tributyrin — received approval for production and marketing in November from the Ministry of Agriculture and Rural Affairs, alongside four other feed additives.

Tributyrin can help repair the small intestinal villi of animals, promote the absorption of nutrients and speed up weight gain of young animals, researchers found.

Hou Yongqing, vice-president of Wuhan Polytechnic University in Hubei province, has led a decade-long effort to develop the additive. As early as 2003, Hou and his colleagues, well aware of the consequence of antibiotic abuse on farm animals, such as the spread of drug-resistant pathogens for animals and humans, started looking into herbs for substances with the potential to replace antimicrobial growth promoters.

“Our team made some promising breakthroughs. However, the herbal extracts have some disadvantages. For example, some unidentified ingredients are hard to isolate and tests usually exhibit inconsistent outcomes,” said the 58-year-old.

In 2013, Hou cast his sight toward tributyrin, a drug that had been widely used to treat intestinal disease and prevent colon cancer in humans.

“As I was going through academic papers, I found that it had also been applied to farm chickens to cure enteric diseases,” he said. “Then I began to conduct research to see if it can be used as a substitute for antibiotics in animal feed.”

Over the past decade, Hou's team has been gathering data to prove to authorities that tributyrin is as safe and effective as an organic feed additive.

According to Hou, after obtaining approval in November, his brainchild has been applied in the raising of pigs and poultry, as well as aquatic animals such as fish and shrimp, and was “well-received and affordable”.

The products have also been exported to more than 20 countries and regions including the United States, and those in Europe and Southeast Asia.

Approved alongside Hou's additive was a feed additive solution developed by the Chongqing Academy of Animal Sciences, which features the organic compound adenosine heptapeptide.

According to the academy's website, the product can bolster an animal's immune response, feed utilization efficiency and is particularly suitable for early-weaned piglets.

## Free tickets



People wait to get on the first smart train in Xixian New Area in Xi'an, Shaanxi province, on Wednesday. The electric train can follow “tracks” painted on the ground. People can travel the 6.5-kilometer route for free during its trial operation.

YUAN JINGZHI / FOR CHINA DAILY

China's approval process for animal feed additives is known to be lengthy and extremely stringent, said Yin Fugui, a Canadian Chinese biologist and animal nutritionist who works for the Guelph Research and Development Centre, and Agri-Food Canada.

“There must be a long line of similar products waiting to seek such approval,” he said.

“The fact that the products have outcompeted their competitors in the screening process endorses their breakthrough importance.”

Starting in the 1950s, countries including the US allowed antibiotics to be used on farm animals to help them grow faster, larger and plumper, and to control the spread of animal diseases.

However, drug abuse among healthy animals has raised alarms among public health experts because it threatens to cultivate super bacteria and lower the effectiveness of antibiotics for human use.

The United Nations said in a report in February that antimicrobial resistance could cause 10 million deaths annually by 2050, and curbing the spread of drug-resistant pathogens will require big changes in how people grow food and treat diseases.

Since 2016, China has barred several types of antibiotics for animal use, such as those considered important for human treatment and those that can linger in the animal body and could cause problems for humans once eaten.

In 2019, a sweeping ban was introduced on the use of antibiotic growth promoters on animal farms starting the following year.

The measures have helped lower the amount of antibiotics consumed by farm animals nationwide from 41,800 metric tons in 2017 to 32,500 tons in 2021, according to figures from the agriculture ministry.

Though antibiotics have been banned from being added to fertilizers, livestock farmers still use the drug on sick animals, experts said.

Zhou Junyan, a researcher at Beijing University of Agriculture who studies the latest developments in feed additives, said the use of the new functional additives will promote the health of farm animals and dent the need for antibiotics for sick ones.

He said that replacing antibiotics with functional additives such as tributyrin brings about myriad benefits, such as curbing costs for farmers and shortening an animal's production cycle, which ultimately helps bolster the efficiency of the animal farming industry.

“It will make China's animal products more competitive globally,” Zhou said.

Apart from helping to produce healthy animal products, Yin, the Canada-based scientist, said that the novel intestinal health solutions could also improve feed utilization and “facilitate ingested nutrients to be re-distributed for animal products”, which means a larger percentage of feed intake would be turned into animal weight gain as opposed to being released out of the body as defecation or heat.

“Improving transition rate is also more of a priority against the backdrop of the US-China trade conflict and China's ambition to achieve carbon neutrality by 2060,” he said.

## Mineral tour



Students tour a minerals exhibition at a science popularization center in Changzhou, Jiangsu province, on Wednesday. The center has nearly 1,000 types of mineral samples from more than 60 countries. XIA CHENXI / FOR CHINA DAILY

## Yangtze River Delta continues to lure China's best, brightest

Hangzhou to relax household registration rules to attract talented professionals

By MA ZHENHUAN in Hangzhou  
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The government of Hangzhou, capital of Zhejiang province, has said it is to further relax rules for household registration, or *hukou*, to attract a wide range of talent and bolster the development of the digital economy.

The city government issued a notice on March 13 to solicit opinions on changes to household registration rules, including expanded access for high-degree graduates and skilled personnel, to address the shortage of high-quality human resources as well as the shortage of skilled personnel.

“Hangzhou not only needs high-quality talent, but also other talent from all walks of life,” said Tang Hairu, deputy director of the Expert Committee of the Hangzhou Bureau

of Planning and Natural Resources. Graduates from junior colleges under the age of 35 who have already been employed in the urban area can settle down in Hangzhou, which will loosen the requirements for degrees.

The notice said those under the age of 45 who have professional qualifications above technician, or have a professional qualification of a senior worker under the age of 35, can settle down in Hangzhou.

Tang explained that the development of Hangzhou's e-commerce industry in recent years has seen an increasing demand for high-quality cross-border e-commerce talent that do not necessarily need undergraduate, graduate or doctoral degrees.

Tang said that advanced manufacturing requires a large number of skilled personnel, and so these

610,000 residents

were added to the permanent population of Zhejiang, Anhui and Jiangsu provinces in 2022.

measures will help Hangzhou accelerate the development of the intelligent manufacturing industry.

As an emerging city with a strong digital economy, Hangzhou is also home to Chinese e-commerce giant Alibaba and a number of other world-leading high-tech companies.

The added value of Hangzhou's digital economy reached 507 billion yuan (\$73.5 billion) in 2022, accounting for 27.1 percent of the city's GDP. Up to 28 percent of its graduates under 35 years old have gone into the IT, internet and video game industries.

The changes in household registration rules have been seen in many big cities across China, such as Zhengzhou in Henan province,

Dalian in Liaoning, Kunming in Yunnan, and Jinan in Shandong.

Niu Fengrui, a researcher at the Chinese Academy of Social Sciences, said the relaxation of *hukou* access for big cities plays an important role in luring talent, accelerating development, optimizing resources and boosting the vitality of cities.

Cities in the Yangtze River Delta region remain a magnet for young talent, according to a report from the National Bureau of Statistics on Feb 28.

Hangzhou saw its population jump by 172,000 people last year, marking the fastest growth among cities in the Yangtze River Delta region. Zhejiang province as a whole recorded a permanent resident population of 65.7 million people last year, up by 370,000 from 2021, the report said.

The permanent resident population of Zhejiang, Anhui and Jiangsu provinces increased by a total of 610,000 while the national population fell by 850,000 in 2022.

## More measures introduced to encourage childbirth

By ZHAO RUIXUE in Jinan  
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Weifang, Shandong province, will exempt senior middle school tuition fees for the third child in every family born after May 31, 2021, local officials announced on Tuesday at a news conference on optimizing policies encouraging families to have more children.

The tuition fee exemption is one of a series of measures released by the city to boost the birthrate. Others include subsidies for universal childcare services, house purchases and medical expenses for childbirth. The government is also optimizing maternity leave and encouraging employers to explore flexible working schedules for female workers.

The newly released measures have received a mixed response from the public with some welcoming the subsidies, while others say the tu-

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Gao Ming, a resident of Qingdao, Shandong province

tion benefit is too little and too far off to make an impact.

“Is the child able to study in a senior middle school if he or she didn't pass the examination?” said one user mockingly on the Twitter-like platform Sina Weibo.

“The measures ... will create an environment that is more friendly to having more children. In the long run, these measures will be helpful in boosting the birthrate,” said Xu Xiaolong, 46, who works at a State-owned enterprise in Weifang.

Among the measures, Weifang

will offer a monthly subsidy of 300 yuan (\$44) for childcare services for a second child and 400 yuan for a third child until the child turns 3. No less than 80 percent of the medical expenses for giving birth to a second child will be covered by medical insurance in Weifang, while giving birth to a third child, at least 90 percent will be covered.

Shandong province, with a population of over 100 million people, in 2022 recorded its lowest birthrate since 1983, according to statistics released by the Shandong Provincial

Bureau of Statistics.

Cities in the province have been ramping up subsidies, and education and nursery care services to encourage families to have more children.

Jinan, capital of Shandong, announced in January that all families that have a second or third child will receive a subsidy of 600 yuan per month per child until the child turns 3.

“To boost the birthrate, authorities need to pay attention to the needs of families with only one child instead of only providing subsidies for couples with two or three children,” said Gao Ming, 35, a resident of Qingdao.

“Whether young couples have a high willingness to have one more child depends mostly on their experience of raising the first child,” she said, adding that she doesn't want to have a second child, even if Qingdao takes similar measures.

## Nation approves first mRNA COVID-19 vaccine

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Domestic drugmaker CSPC Pharmaceutical Group said on Wednesday that its messenger RNA COVID-19 vaccine has gained emergency use authorization from China's top drug regulator.

The vaccine, named SYS6006, is designed to target the BA.5 variant of Omicron, the company said in a

statement released on its website.

It is the first mRNA vaccine to be approved for use on the Chinese mainland. The drug was approved for clinical trials in April last year. So far, it has gone through the first two trial phases, and research on its effectiveness as a booster shot has been completed.

Trials involving over 5,500 participants have confirmed its safety, immunogenicity and protective

effects, the company said.

The incidence rate and severity of adverse reactions among younger participants was much higher than among the elderly, it added.

When a dose of SYS6006 was delivered as a booster shot to people who had been vaccinated with two or three doses of inactivated vaccines, it demonstrated good protective effects against multiple variants, including BA.5, BF.7,

BQ.1.1, XBB.1.5 and CH.1.1.

Research data also show that the vaccine can induce T cell memory response against different variants, including Delta and the BA.2 and BA.5 Omicron variants.

The product should be stored at temperatures between 2 to 8 C.

By the end of last year, China had granted conditional market approval to five COVID-19 vaccines and emergency use approval to eight vaccines.