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# Under-forest Breeding Pattern and the Practice Form

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**Abstract** Through the development in recent years, China's under-forest breeding pattern can be divided into four kinds of practice form of under-forest breeding pattern (the pattern of breeding driven by leading enterprises; the pattern of breeding driven by intermediary economic organizations; the pattern of breeding driven by the professional wholesale market; the pattern of breeding driven by the modern animal husbandry demonstration areas), according to difference in the main body participating in signing the operation contract in breeding pattern. In the production practice of under-forest breeding pattern, the most widely used and successful pattern is the pattern of breeding driven by leading enterprises and its derivative forms.

**Key words** Under-forest breeding, Pattern, Practice form

Under-forest economy refers to the compound operation of forestry, agriculture, animal husbandry and many other types of project, carried out under the canopy of the forest by virtue of the ecological environment of woodland, using the woodland resources<sup>[1]</sup>. In recent years, China vigorously promotes the development of forestry economy; the under-forest breeding in Guangxi, Sichuan, Chongqing and other provinces and cities, develops by leaps and bounds. Under-forest breeding is regarded as a kind of pattern of circular economy, relying on the woodland resources, science and technology, taking full advantage of the under-forest natural conditions. It selects the livestock and poultry species that suit under-forest breeding, for rational breeding. Through many years of production practice, various regions have explored a series of under-forest breeding patterns and production practice forms suitable for local development.

## 1 The connotation of under-forest breeding pattern

**1.1 Breeding pattern** The pattern is a relatively stable operating form of organization or body, and the breeding pattern is a kind of production and operation pattern. The formation of the production and operation pattern is related to changes in the production mode and agricultural production mode. The production pattern is a way to obtain material goods. In economics, the technology mode of production or production method is also known as production pattern, the manifestation of which in agriculture is agricultural production pattern, having gone through the agricultural production pattern of primitive agriculture, ancient agriculture, premodern agriculture, modern agriculture. Socio-economic development makes all kinds of occupations form their own production and operation pattern, so the produc-

tion and operation pattern is the general term of management pattern adopted according to different economic conditions in production and operation. It is concrete manifestation of operation mode, reflecting different levels of economic development.

**1.2 Under-forest breeding pattern** The under-forest breeding pattern is the general term of management pattern of under-forest breeding industry adopted according to different economic conditions in the operation of under-forest breeding. It can achieve the optimal allocation of production factors and the relatively stable operating form in the operation of under-forest breeding.

The pattern includes the household contract operation of under-forest breeding, "company + farmers", industrialization operation, and other operating patterns. In fact, it is the optimization and combination form, industrialization operating form of production factor resources that are related to under-forest breeding production and operation, such as land, capital, labor, and entrepreneurs' talent, in accordance with the development requirements of production and operation in under-forest breeding. It mainly finds expression in "company + farmers", and a variety of derivative forms based on this. In production practice, it is to breed pigs, beef cattle, dairy cattle, sheep, goose, chickens, duck, etc. under forest, efficiently using under-forest insects, small animals, weeds, and other resources. This can not only establish stable ecosystem of forestry and animal husbandry, increase woodland biodiversity, but also open up a new path for developing rural economy and increasing farmers' income.

## 2 Project operation mechanism of under-forest breeding pattern

Mechanism refers to the structure and working modes of all subsystems and their mutual relations in a complex working system; also refers to the general term of the operating mechanism and system of an organization<sup>[2]</sup>. The operation mechanism of under-forest breeding project is the general term of a set of systems and operating mechanisms of the combination and configuration of various production factors involved in the

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production of leading under-forest breeding enterprises and under-forest breeding farmers. The operating mechanism of a va-

riety of practice forms abstracted, of under-forest breeding projects in reality, is in general shown in Fig. 1.

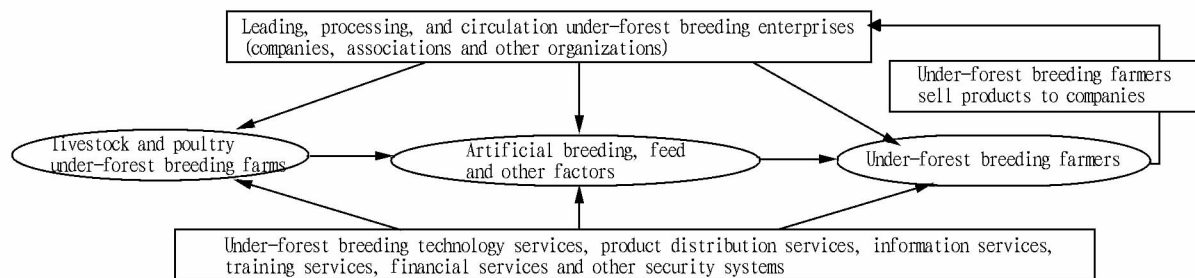


Fig. 1 Operation schema of under-forest breeding project

### 3 The current practice form of under-forest breeding pattern

#### 3.1 The pattern of under-forest breeding driven by leading enterprises

**3.1.1** Brief introduction to the pattern of under-forest breeding driven by leading enterprises. The pattern of breeding driven by leading enterprises is also called the pattern relying on production, breeding and processing enterprises. The under-forest breeding and processing enterprises sign purchase and sale contract of under-forest breeding products with farmers, and the under-forest breeding farmers conduct production in accordance with the requirements of enterprises, becoming "production workshop of under-forest breeding products" under the control of enterprises.

The leading under-forest breeding, processing enterprises in the practice (hereinafter referred to as company) + farmers is the basic form. In the early conventional breeding, Chia Tai Group of Thailand is the best representative. Chia Tai Group of Thailand was formed in the 1970s. The main products operated by it include feed, pigs, eggs and the high value-added foods. It takes domestic and foreign markets as the objective and regards the processing industry as the leading industry, implementing "one package" of breeding, planting, preservation, processing, packaging, and marketing. The group links big markets and thousands of families, providing a series of services, implementing continuity operation and comprehensive management, to drive the national agricultural production. This pattern was introduced into China in the 1980s.

In China's under-forest breeding, some practice forms take shape based on under-forest breeding company + farmers, such as under-forest breeding company + specialized cooperative organizations + farmers, under-forest breeding company + base + farmers, under-forest breeding company + specialized cooperative organizations + base + farmers, and under-forest breeding company + government + farmers.

**3.1.2** Operation of the pattern of under-forest breeding driven by leading enterprises. The leading enterprises in the pattern of breeding driven by leading enterprises provide "one package" services for farmers' production, and this is a kind of "leading economic pattern". In general, the operation includes the following 7 steps: farmers' application for the under-forest breeding products, such as under-forest pig, cattle, poultry, etc. ;

the company site assessment; account opening of farmers' company; farmers' payment of circulating capital; receiving the strains of pigs, cattle, and poultry; receiving materials and technology; marketing of under-forest pigs, cattle, poultry products.

The farmers or specialized households, having necessary conditions for under-forest breeding (such as qualified farm and high sense of responsibility), receive the application form of under-forest breeding of pigs, cattle, and poultry from the service department of the leading companies by identification card, and submit the application form to the service department for approval after filling out. After the approval, the service departments of the leading companies send specialized personnel to conduct field survey. After the pigs, cattle and poultry pen layout, construction, sewage, transportation and other rearing conditions meet company standards, farmers open an account in the service departments of the companies. By the certificate form approved by the service department after field assessment, the farmers open an account in the service departments of the companies, and pay the revolving funds of under-forest breeding stipulated. The service departments arrange the strains receiving time from the date when the farmers pay the revolving funds of under-forest breeding, and they receive the livestock and poultry strains in the specified livestock breeding station on time. By *Record of Goods Received*, the farmers receive the feed and drug from the corresponding departments in the form of accounting, without delivery of cash, and after the livestock and poultry bred under forest come into the market, the account is closed. Veterinary and technical advisory services points in the services departments, provide free consulting services. By the "on the market" notice of the service departments of the companies on the livestock and poultry bred under forestry, the farmers transport the livestock and poultry up to the standards to the marketing departments of the companies or the companies go to the designated places to purchase the livestock and poultry bred under forestry.

#### 3.2 The pattern of under-forest breeding driven by intermediary economic organizations

**3.2.1** Brief introduction to the pattern of under-forest breeding driven by intermediary economic organizations. The pattern of breeding driven by intermediary economic organizations can be also called the pattern of breeding relying on the industry associations. Namely the under-forest breeding farmers sign the

production and sales contracts of under-forest livestock and poultry products, or loose agreement with specialized cooperative economic organizations and professional associations, to develop under-forest breeding industry. In the practice, there are various forms, such as "industry association + farmers", and "specialized cooperative economic organizations + farmers". The under-forest breeding farmer intermediary cooperative economic organizations mainly include under-forest breeding farmer cooperatives, joint stock under-forest breeding farmer cooperatives, under-forest breeding farmer professional associations and other types.

The intermediary economic organizations in such pattern, take "providing services for under-forest breeding farmers" as purpose, composed of the under-forest breeding farmers voluntarily. Intermediary economic organizations provide market information on under-forest livestock and poultry products, under-forest breeding materials and under-forest breeding techniques to under-forest breeding farmers; provide services to under-forest breeding farmers, coordinate their actions and unify the standards, not for profit; unify management, directly enter into the market, and pursue profit maximization. Each member is not only the stakeholder of interests but also the bearer of risks; cooperation is a prerequisite, and those able men take the lead, to achieve common development.

For example, the large under-forest chicken or cattle breeding households take the lead to establish under-forest breeding associations; large under-forest breeding enterprises take the lead to establish associations; the backbone enterprises in the circulation field take the lead to establish associations supported by the government in terms of funding and business; some township governments with rich woodland resources take the lead to establish associations; the villages take the lead to establish associations; the supply and marketing cooperatives take the lead to establish associations.

**3.2.2 Operation of the pattern of under-forest breeding driven by intermediary economic organizations.** There are similarities between the operation of the pattern of breeding driven by intermediary economic organizations and the operation of the afore-said pattern of breeding driven by leading enterprises. For example, in the form of contract, some associations order the under-forest breeding feed, drug, livestock breed, and production technology; sell the pigs and so on to the outside.

From the perspective of the development of under-forest breeding practice across the country, associations and other cooperative economic organizations can really give many benefits to under-forest breeding farmers, promoting the industrialization level of under-forest breeding and organizational level of farmers. In addition, these organizations are the media for coordinating the interests relations between under-forest breeding farmers and market, playing a better role in solving the contradictions and conflicts of interest between farmers, between farmers and the market.

### **3.3 The pattern of under-forest breeding driven by the professional wholesale market**

#### **3.3.1 Brief introduction to the pattern of under-forest breeding**

driven by the professional wholesale market. The pattern of breeding driven by the professional wholesale market can be also called the pattern of breeding relying on the market. Large and medium-sized specialized wholesale markets of under-forest breeding livestock and poultry products, sign purchase and sales contracts of under-forest livestock and poultry products with under-forest breeding farmers, or provide the trading platform of under-forest breeding livestock and poultry products for under-forest breeding farmers, to promote the development of the under-forest breeding industry.

In the practice, there are various forms and derivative forms, such as "market + farmers", "market + specialized cooperative organizations + farmers" and "market + base + farmers". Through the large-scale wholesale market, online market, and futures market of under-forest breeding livestock and poultry products, the under-forest livestock and poultry bred by under-forest breeding farmers are sold, which reduces the farmers' transaction costs, so that the farmers can obtain moderate profit as much as possible, promoting the industrialization development of under-forest breeding industry.

**3.3.2 Operation of the pattern of under-forest breeding driven by the professional wholesale market.** The operation of pattern of breeding driven by the professional wholesale market is divided into the rigorous purchase and sale contracts, and loose market contracts. The operation of the rigorous purchase and sale contracts is that the specialized wholesale markets of under-forest livestock and poultry products, purchase and sell out the under-forest breeding farmers' livestock and poultry products, on the basis of the agreed standards and prices of under-forest livestock and poultry products, to obtain corresponding profit, or the specialized wholesale markets of under-forest livestock and poultry products, sell out the under-forest breeding farmers' livestock and poultry products, in the form of auction, to get commission. The operation of purchase and sale contracts is that the under-forest breeding farmers use the specialized wholesale markets of under-forest livestock and poultry products, for the trading of livestock and poultry products that they produce, which is a kind of market contract cooperation.

The operation of this pattern requires the administration for industry and commerce and price department to intensify market management, cracking down on some illegal acts, such as hoarding, price gouging, and disrupting the order of the market price, to stabilize goods price, maintain the market price order, and regulate the market transaction of under-forest livestock and poultry products.

Moreover, there are circulation organizations participating in the operation of the pattern of breeding driven by the professional wholesale market. Some under-forest breeding circulation enterprises, such as distribution companies, brokers and merchants, cooperate with the under-forest breeding farmers; some under-forest pig and poultry brokers aid the farmers in selling under-forest pigs and poultry. For example, in Rongchang County which enjoys the reputation as the City of Animal Science and Technology in China, there are nearly 1000 under-forest pigs, cattle and poultry brokers or circulation en-

terprises involved in promoting the industrialized production development of under-forest Rongchang pigs and commercial pigs, poultry and so on. Thus, "under-forest breeding circulation enterprises + farmers", "supermarkets + specialized cooperative organizations + farmers, pigs and poultry", "pig and poultry meat repository + farmers", "supermarkets + base + farmers", and many other forms in the practice are promoting the development of under-forest breeding industry.

### 3.4 The pattern of under-forest breeding driven by the modern animal husbandry demonstration areas

**3.4.1** Brief introduction to the pattern of under-forest breeding driven by the modern animal husbandry demonstration areas. The modern animal husbandry demonstration zone is the pig industrialization development-driven pattern, determined by the party and state government, in accordance with the regional economic development and the theory of comparative advantage. This pattern integrates animal husbandry, industry and commerce; planting, breeding and processing; marketing, supply and production; agriculture, science and teaching; production, study and research. This pattern achieves the integrated functions of regionalization, specialization, industrialization, modernization, and demonstration, thereby comprehensively driving the industrialization operation and development of pigs in the region, the surrounding areas and even the entire country.

At present, the modern animal husbandry demonstration area determined by China is Chongqing, and the core area of the first modern animal husbandry demonstration area has been established in Rongchang County of Chongqing after the approval of the Ministry of Agriculture. In the second half of 2009, it was officially constructed. This is based on many years of rapid development in Rongchang County. Compared with other regions, it has formed comparative advantages in the livestock and poultry breed resources and animal husbandry science and education. In the Rongchang modern animal husbandry demonstration area, the under-forest breeding of pigs and poultry is explored, achieving significant results.

**3.4.2** Operation of the pattern of under-forest breeding driven by the modern animal husbandry demonstration areas. The operation of the pattern of breeding driven by the modern animal husbandry demonstration areas is mainly "government setting up the stage, enterprises singing opera and farmers participating". The government of Rongchang County (core area of modern animal husbandry demonstration area), is focusing on promoting the construction of under-forest pigs and poultry standardized production demonstration bases, market information centers, logistics centers, the museum of Chinese pigs, and hi-tech processing enterprise demonstration parks of pigs and other livestock products, in order to play a core demonstra-

tion role. This pattern solves the difficulty in financing for the development of under-forest breeding industry, and resolves low commercialization rate and great market volatility of under-forest pigs, poultry and other livestock products.

Through the research institutes-driven pattern, the pattern of breeding driven by leading enterprises, the pattern of breeding driven by the professional wholesale market, the integrated enterprise-driven pattern, and many other forms of operation, the modern animal husbandry demonstration area in fact adopts factor contract or market contract, to lead the under-forest breeding farmers to promote the industrialization level of under-forest breeding industry.

## 4 Conclusions

In the various practice forms of under-forest breeding pattern in recent years, it is necessary to improve the rate of honoring an agreement, signing the flexible and operable risk-sharing contracts. The government should strengthen management and guidance, to establish the modern animal husbandry demonstration area; establish the risk prevention mechanism of under-forest breeding industry (such as the establishment of risk prevention funds and the development of under-forest livestock and poultry product futures market); take appropriate profit-sharing mechanism and use the special investment to stabilize contract, or make the farmers and enterprises buy a share mutually, to achieve the integration of assets, funds, etc.; at the same time, strengthen the rule of law and integrity education, and establish honor mechanism; gradually cultivate and perfect under-forest breeding intermediary economic organizations, so that two or more parties in the pattern carry out truly in-depth sincere cooperation after repeated game, jointly promoting the sustainable development of under-forest breeding industry in China.

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