

# Systematic Analysis on the Development of Animal Husbandry Ecological Economy in Baotou City

journal or publication title	STUDIES OF REGIONAL POLICY
volume	24
number	4
page range	43-54
year	2022-03-31
URL	<a href="http://doi.org/10.20635/00001248">http://doi.org/10.20635/00001248</a>

# Systematic Analysis on the Development of Animal Husbandry Ecological Economy in Baotou City

ZHOU Hua

## Abstract

With the proposal of the national major strategy of "ecological protection and high-quality development of the Yellow River Basin", Baotou Yellow River Basin, as one of the important river basins for the implementation of the strategy of "ecological protection and high-quality development of the Yellow River Basin", adheres to ecological priority and high-quality development constructs an ecological corridor along the Yellow River and builds Baotou Yellow River basin into an ecological economic belt with sustainable development The overall promotion of the strategy of "ecological protection and high-quality development in the Yellow River Basin" is very important.

Based on the strategy of "ecological protection and high-quality development of Baotou Yellow River Basin" and the high-quality development of animal husbandry in the Baotou Yellow River basin economic belt, this study studies the reconstruction of animal husbandry eco-economic system and policy innovation, so as to provide decision-making basis for local government ecological governance and high-quality development policy-making.

Keywords : Baotou City animal husbandry ecological economy; Consumption subsystem; Production subsystem; Technical subsystem; Management subsystem

## I . Introduction

With the proposal of the national major strategy of "ecological protection and high-quality development of the Yellow River Basin", Baotou Yellow River Basin, as one of the important river basins for the implementation of the strategy of "ecological protection and high-quality development of the Yellow River Basin", adheres to ecological priority and high-quality

development constructs an ecological corridor along the Yellow River and builds Baotou Yellow River basin into an ecological economic belt with sustainable development. The overall promotion of the strategy of "ecological protection and high-quality development in the Yellow River Basin" is very important.

Based on the strategy of "ecological protection and high-quality development of Baotou Yellow River Basin" and the high-quality development of animal husbandry in the Baotou Yellow River basin economic belt, this study studies the reconstruction of animal husbandry eco-economic system and policy innovation, so as to provide decision-making basis for local government ecological governance and high-quality development policy-making.

Academia has conducted a lot of research around the development of ecological animal husbandry. The research contents mainly include the development mode and effectiveness of ecological animal husbandry, the path and Countermeasures of animal husbandry ecological economic development, the connotation and characteristics of animal husbandry ecological economic system, ecological animal husbandry systems, and regulations, and the development concept of ecological animal husbandry.

Xing Tingxi (1999) believed that the establishment of animal husbandry ecological engineering is the only way to realize high-efficiency and energy-saving animal husbandry<sup>1)</sup>. Sun Zhenjun (2001) elaborated on the design principle of animal husbandry ecological engineering<sup>2)</sup>. Meng Fandong et al. (2012) analyzed and defined the connotation and characteristics of the animal husbandry eco economic system<sup>3)</sup>. Cheng Changlin et al. (2017) analyzed the ecological, social and economic coupling and coordinated development model of community animal husbandry on the Qinghai Tibet Plateau<sup>4)</sup>. Wang Guo (2019) put forward the Countermeasures for the healthy development of domestic animal husbandry ecological economy by analyzing the advanced development experience of foreign animal husbandry ecological economy and comparing the differences between Chinese and foreign animal husbandry ecological economy<sup>5)</sup>. Nanding et al. (2012) pointed out that in order to promote the development of animal husbandry ecological economy towards intensive production, the U.S. government has formulated policies such as basic subsidies, income support, and organic agriculture support<sup>6)</sup>. In the production process of Japan's animal husbandry eco economic system, the investment in fixed assets such as livestock, breeding facilities, and equipment accounts for 80% of the total investment. This high input-intensive production mode has continuously reduced the number and expanded the scale of animal husbandry farms in Japan, and improved the intensive production level of the animal husbandry eco economy (Wang Jimin, 2012)<sup>7)</sup>. In order to realize the sustainable development of animal husbandry, the Japanese government requires the combination of pastures, fields, and

gardens to form an ecological leisure animal husbandry system (Liu Zhiyi, 2014)<sup>8)</sup> .

David Guan (2017) found through his research on animal husbandry in Australia that the Australian government not only strengthened grassland construction, adopted regional rotational grazing, seasonal rest grazing, and other means to carry out ecological management on the existing grassland, but also established artificial grassland and formulated reasonable livestock carrying capacity for each grassland, so as to ensure the normal supply of forage and achieve sustainable development<sup>9)</sup> . Zhao Xuejie (2020) pointed out through the research on Ecological Animal Husbandry in the Netherlands that the legal system of animal husbandry in the Netherlands has the advantages of sound laws and regulations, paying attention to risk monitoring and evaluation, strong coordination of management institutions, and so on<sup>10)</sup> . Liu Yang et al. (2020) pointed out that Heilongjiang Province has the basic conditions for developing ecological animal husbandry tourism, but there are still some problems in the development concept, objectives, level, and human resources<sup>11)</sup> . Zhou Ximei et al. (2020) took the ecological animal husbandry cooperatives in the four provinces of Qinghai Tibet and new Mongolia as the research object. In view of the lack of professional talents of cooperatives and the limitation of stock cooperation to form, they proposed that we should further deepen the reform of "separation of three rights" in grassland, improve the operation mechanism of cooperative organizations, protect the legitimate rights and interests of farmers, and improve the supervision and incentive mechanism<sup>12)</sup> .

Yu fawen et al. (2021), based on the interpretation of the theoretical connotation of high-quality development of animal husbandry from three aspects: era background, connotation characteristics, and ecological orientation, put forward six paths to realize high-quality development of animal husbandry<sup>13)</sup> . Su Wei et al. (2021) based on summarizing the era value of developing ecological animal husbandry, analyzed the restrictive factors of the current development of ecological animal husbandry from three aspects: ideology, legal system, and industrial distribution, and put forward countermeasures and suggestions for the development of ecological animal husbandry<sup>14)</sup> . Li Ming et al. (2021) proposed that through the innovation of governance concept, governance mechanism, and governance means and the systematic integration of existing policies and project funds, the construction of ecological animal husbandry special zone can be steadily promoted, so as to achieve the goal of nourishing animal husbandry with ecology and feeding ecology with animal husbandry<sup>15)</sup> .

The content of the above literature research is an important aspect of the development of ecological animal husbandry, which provides a theoretical and practical reference for this research, but the existing research still has room for further expansion and deepening. First,

there is no systematic theoretical interpretation of the ecological-economic development of animal husbandry; Second, there is no systematic analysis of the development concept, connotation, and characteristics of animal husbandry ecological economy; Third, there are few systematic analyses and Research on the development of animal husbandry ecological economy. The research mainly focuses on the connotation, characteristics, significance of animal husbandry ecological economy, and the existing problems of regional animal husbandry ecological development.

## **II. Theoretical Connotation and System Structure of Ecological Economic Development of Animal Husbandry**

### **1. Ecological economy of animal husbandry**

The process of animal husbandry production is essentially a process of continuous movement and change of animal husbandry ecological economy and technology, and the process of the material, energy, and information exchange between animal husbandry ecological economy system and the environment. Therefore, animal husbandry ecological economy requires that the development of animal husbandry be placed under the background of human economic and social development and ecological environment, make scientific and rational use of various natural and economic resources required for the development of animal husbandry, actively apply science and technology, save resources, protect ecology, realize the scientific development, utilization and organic cycle of animal husbandry ecological resources, and establish a high-yield, efficient, high-quality Low consumption animal husbandry ecological economic system and circular economic system to realize the healthy, stable and sustainable development of animal husbandry.

What animal husbandry ecological economy emphasizes is to connect animal husbandry production system with society, economic system, and ecosystem for comprehensive research, so as to realize the coordinated development of economy, society, and natural ecology, and achieve the optimal goal of animal husbandry ecological economy<sup>16)</sup>.

### **2. Structure of Animal Husbandry Eco Economic System**

Based on the complexity of the animal husbandry eco economic system, this study mainly analyzes it from four dimensions: production (enterprise), consumption (customer), management (government), and technology. In the animal husbandry eco economic system, the respective roles and functions of production (enterprise), consumption (consumer), management (government), and technology are different. However, as the four subsystems of the animal

husbandry ecosystem, it plays a key role in the coupling of the animal husbandry economic system and ecosystem and the effective operation of the whole system(shown in Figure 1).

### **2.1 Consumption Subsystem**

With the implementation and deepening of the major national strategy for the construction of ecological civilization, people's consumption demand has gradually changed from simple and stable to complex and changeable, and the consumption concept has gradually changed from the mainstream traditional consumption concept to the green and low-carbon ecological consumption concept. Ecological consumption is an ecological consumption mode, which can not only meet the development level of material production and ecological production but also meet people's consumption needs and do no harm to the ecological environment.

As livestock meat food is the main source of human high-quality protein, lipids, fat-soluble vitamins, B vitamins, and minerals, human consumption and consumption behavior of livestock products constitute the basis of the operation of animal husbandry ecological economic system. In the animal husbandry eco economic system, the function of the consumption subsystem is mainly to realize the coupling of ecological operation and economic operation of consumers in the consumption process, which is specifically reflected in the ecology of consumers' consumption and consumption behavior of ecological animal husbandry products.

### **2.2 Production Subsystem**

Corresponding to the consumption subsystem is the production subsystem, that is, the supplier of ecological animal husbandry products. The function of the production subsystem is mainly manifested in the ecological production of animal husbandry products, that is, industrial ecology. The development of industry not only depends on the development of the industry itself but is also affected by the development of related industries. Therefore, the ecology of animal husbandry also includes the ecology of its production and the ecology of related industries.

From the perspective of the animal husbandry industry itself, the ecological performance of animal husbandry is that meat and poultry products meet the characteristics of ecological products and are harmless to human health and the ecological environment in function and utility. From the perspective of related industries, one is to provide production factors for animal husbandry, such as raw materials, required semi-finished products, funds, and so on; Second, the development of related industries can bring new market demand to the industry. If animal husbandry is not coordinated with related industries, it will inevitably lead to competition and waste of resources.

### **2.3 Technical subsystem**

As an important means of animal husbandry economic development, science and technology

play an indispensable role in the ecological and economic regulation of animal husbandry ecological economic system. In other words, as a subsystem of the animal husbandry ecological economy, technology should not only meet people's needs but also take into account the protection and sustainable development of the ecological environment, so as to realize the harmonious unity of humans, livestock, and nature.

Therefore, in the animal husbandry ecological economic system, the technology subsystem is not only the premise and guarantee for the effective operation of the production subsystem and consumption subsystem, but also the core of the management subsystem to realize scientific management.

### 2.4 Management Subsystem

As the management subsystem of the animal husbandry ecological economic system, the main goal of the government is to build an external environment for the good operation of the ecological economy, to reflect the behavior norms and tendencies of various subjects in the ecological economic system. Therefore, the government naturally becomes the manager in ecological activities, and the ecological management behavior led by the government constitutes the government mechanism in the ecological economy.

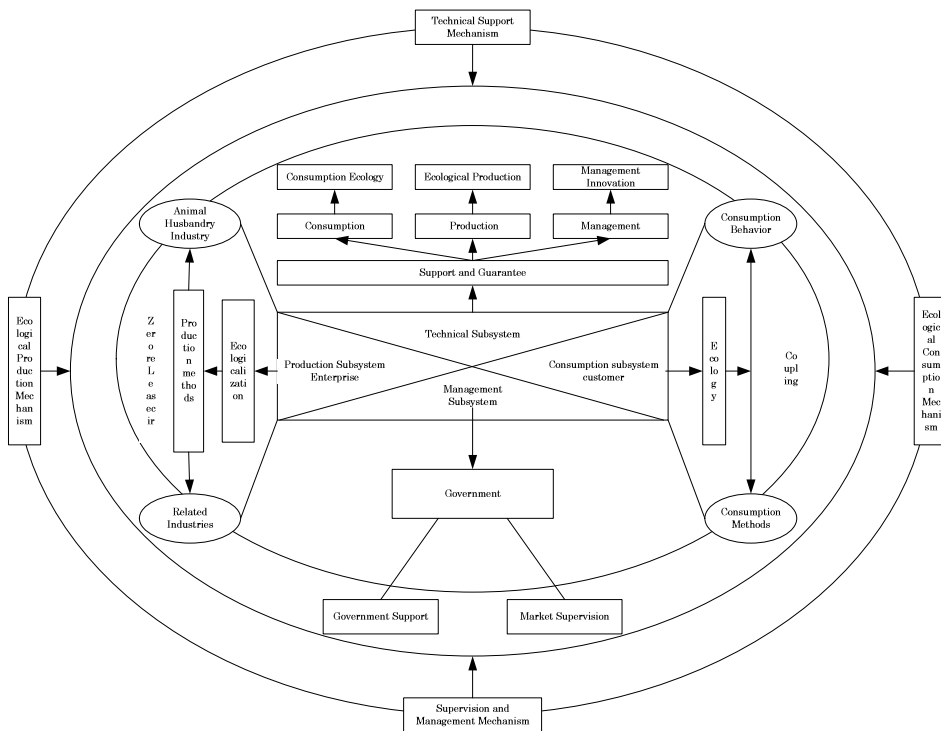


Figure 1: structure of animal husbandry eco economic system

To sum up, the effective operation and good cycle of sustainable development of animal husbandry eco economic system is the result of the interaction of each subsystem. In other words, the formation of the animal husbandry eco-economic system is inseparable from the contribution of each subsystem. The continuous material circulation and energy flow of each subsystem also determine the sustainability of the development of the animal husbandry eco-economic system.

### **III. Analysis of Ecological Economic System of Animal Husbandry in Baotou City**

#### **1. Basic Overview of Animal Husbandry Ecological Economy in Baotou City**

Baotou is located in the west of the central part of Inner Mongolia Autonomous Region, adjacent to Hohhot in the East and bayanhoer in the West; Mongolia is connected to the north, the Yellow River to the south, and Quechuan plain and Hetao plain to the East and West. As of 2018, the city has jurisdiction over 6 districts, 1 county, and 2 banners, with a total area of 27768km<sup>2</sup>, The grassland area is 2086.5km<sup>2</sup>. As of 0:00 on November 1, 2020, the permanent resident population of Baotou city is 2709378. Baotou is rich in cultivated land resources and fertile land, with sufficient crop straw and forage, which has laid a foundation for the development of animal husbandry in Baotou.

In 2020, there are 161100 pigs in Baotou; There are 146800 cattle in stock; There are 31200 horses and cattle in stock; 2.6704 million sheep; There are 8300 donkeys in stock; 8300 mules in stock; There are 0900 camels in stock. In 2020, the meat output of Baotou city will be 163045 tons; The output of milk is 669911 tons; The wool production of sheep is 4273 tons; The output of goat wool is 694 tons; The output of cashmere is 399 tons; The output of poultry eggs is 46460 tons. Calculated at comparable prices, the total output value of animal husbandry in Baotou will reach 11667.08 million yuan in 2020, accounting for more than half of the total output value of agriculture, forestry, animal husbandry, and fishery, accounting for 61.9%.

#### **2. Structure and characteristics of animal husbandry eco economic system in Baotou City**

Based on the above structure diagram of the animal husbandry eco economic system (Figure 1), this study can define Baotou animal husbandry eco economic system as the effective coupling of ecological operation and economic operation of animal husbandry eco economic system, so as to realize the harmonious unity of economy, society and ecology of animal husbandry. Therefore, the ecological economic system of animal husbandry in Baotou is mainly composed of four subsystems: consumption subsystem, production subsystem, technical service subsystem, and



government subsystem.

### **2.1 Consumption Subsystem**

As the premise and foundation of animal husbandry ecological economic development, the function of the consumption subsystem is mainly reflected in the following aspects. First of all, the consumption subsystem needs to meet the needs of Baotou citizens for animal husbandry products and ensure the most basic material needs of residents for animal husbandry products. Secondly, the consumption subsystem needs to realize the ecology of consumption and ensure that it meets the requirements of ecological consumption. In other words, we should not only improve the health literacy of residents but also comprehensively strengthen the protection of the ecological environment. The main elements of the consumption subsystem include population, natural population growth rate, per capita disposable income, per capita consumption of animal husbandry products and the harm to the ecology caused by the consumption of animal husbandry products.

The main elements of the consumption subsystem include population, natural population growth rate, per capita disposable income, per capita consumption of animal husbandry products and the harm to the ecology caused by the consumption of animal husbandry products.

### **2.2 Production Subsystem**

As the main supply body of the animal husbandry eco economic system, the production subsystem needs to maintain the balance of ecological and economic operation while realizing the supply of the whole system. Therefore, the production subsystem has become the subsystem with the greatest impact on the ecological operation in the whole animal husbandry ecosystem, which is directly related to the realization of the goal of the whole animal husbandry ecosystem.

The main elements of the production subsystem include industrial production capacity, industrial concentration, industrial structure, industrial assets, industrial pollution (untreated), resource load caused by industry, etc.

### **2.3 Technical Subsystem**

As the support and guidance of animal husbandry eco economic development, the function of the technology subsystem is to realize the transformation and upgrading of the animal husbandry eco-economic system.

The support of the technology subsystem to other subsystems is mainly reflected in the following four aspects: firstly, technological progress has changed the elements of productivity, promoted the all-around development of social productivity, improved residents' material and living standards, and increased residents' income. Secondly, technological progress improves the level of education, promotes the improvement of residents' quality, and promotes the ecology of

consumption, so as to promote the benign operation of the overall ecological economy; Thirdly, technological innovation promotes the transformation and upgrading of animal husbandry enterprises, effectively reduces the production and management costs of animal husbandry enterprises, improves the benefits of animal husbandry enterprises, and improves the production capacity of the green and low-carbon cycle of enterprises; Fourth, technological progress promotes the innovation of modern decision-making technology, statistical technology, information technology, and ecological technology, to improve the government's decision-making ability and the management ability of animal husbandry related management departments, and realize the coordination and unity of effective market and promising government.

The main elements of the technology subsystem include scientific and technological investment, scientific and technological progress factors, education investment, animal husbandry R & D investment, the number of animal husbandry patented technologies, etc.

#### **2.4 Management Subsystem**

As the main body of the management subsystem, Baotou municipal government plays the function of supervision and management in the operation of the animal husbandry ecological economic system and realizes the effective guidance and supervision of animal husbandry ecological economic development. In other words, the government management subsystem guides enterprises and residents to have a correct view of consumption and production. Its function is mainly to restrict and stop non-standard behaviors in the market economy through economic punishment and direct supervision departments.

The main elements of the government management subsystem include policy guidance, quarantine restrictions, pollutant discharge restrictions, environmental load restrictions, etc.

### **IV. The Path to Realizing the Ecological and Economic Development of Animal Husbandry in Baotou City**

The guiding opinions of the State Council on promoting the revitalization of rural industries pointed out that we should firmly establish a new development concept, implement the requirements of high-quality development, adhere to the general policy of giving priority to the development of agriculture and rural areas, and realize the modernization of agriculture and rural areas<sup>17)</sup>.

In March 2019, General Secretary Xi Jinping pointed out at the important speech work conference to Inner Mongolia that accelerating the construction of a modern agricultural and animal husbandry industry system and achieving high-quality and high-efficiency ecological

animal husbandry is of great importance to accelerating the realization of high-quality ecological and economic development of animal husbandry in Baotou.

Therefore, taking the implementation of the Rural Revitalization Strategy as the general starting point and vigorously developing the modern agriculture and animal husbandry in Baotou, and building the industrial base of agricultural and livestock products as the mainline, this paper explores the ecological path of the ecological-economic development of animal husbandry in Baotou.

### **1. According to Local Conditions, Clarify the Development Direction of Animal Husbandry Ecological Economy and Innovate the Development Mode of Animal Husbandry Ecological Economy.**

From the above analysis of animal husbandry ecological and economic development, realizing the harmonious unity of animal husbandry ecological operation and economic operation is the basic starting point and the most fundamental goal of animal husbandry ecological and economic development in Baotou city.

The realization of its purpose needs to be guided by the concept of green development. Firstly, consumers are the key to the development of the animal husbandry ecological economy. Therefore, combined with the market situation of Baotou City, accelerating the popularization of ecological consumption of animal products and guiding residents to establish correct ecological consumption concept and adopt correct consumption behavior is the basis for the construction of animal husbandry ecological economic system. Secondly, promote the green transformation of production behavior and production mode of animal husbandry enterprises and related industrial production subjects, realize the greening of the whole industrial chain, and promote the sustainable development of animal husbandry ecological economy while meeting the increasing demand of consumers for high-quality, safe and healthy animal husbandry products. Third, based on the development advantages of animal husbandry in Baotou, implement the strategic layout of grass livestock balance, industrial integration, and combination of planting and breeding, and build a grassland animal husbandry base, animal husbandry base in agricultural and pastoral areas, and animal husbandry base in agricultural areas with the characteristics of Baotou.

### **2. Strengthen Technological Innovation and Promote the Transformation and Upgrading of Ecological Animal Husbandry**

To realize the sustainable development of animal husbandry ecological economy in Baotou, we not only need to innovate animal husbandry technology but also need to apply the achievements of modern information technology (Internet of things, cloud computing, big data, artificial intelligence, and other informatization) as a platform to provide support and guarantee. Firstly,

improve the scientific and technological innovation ability of animal husbandry through technological innovation, so as to promote the transformation and upgrading of ecological animal husbandry in Baotou City, and realize the parallel development of high-quality development and benefit improvement. Secondly, with big data, cloud computing, and other information technologies as the driving means, the system collects the data of various links of animal husbandry before, during, and after production, deeply excavates the potential value of these data, and runs through the whole industry chain from forage production, feed supply, breeding management to animal product consumption, so as to realize the purpose of forwarding traceability and reverse traceability of information data, Provide a reference for scientific decision-making and boost the development of intelligent animal husbandry<sup>18)</sup>.

### 3. Strengthen Policy Support and Improve the Supervision System.

In the process of transformation and upgrading of ecological animal husbandry in Baotou City, the government, as the management subject of the ecological economic system, implements accurate and stable policies and measures and improves the supervision system, which is the premise to realize the effective operation of the ecological economy of animal husbandry.

Firstly, according to the actual situation of animal husbandry area in Baotou City and the "ecological red line" of livestock and poultry breeding prohibition and restriction, while vigorously supporting the development of high-quality forage industry, gradually increase the policy support for standardized and standardized breeding.

Secondly, accelerate the construction and improvement of the supervision system, clarify the management standards, technical standards, safety standards, and product standards that the management subject should implement, and strictly supervise them according to their standards.

(しゅう か・内モンゴル科技大学包頭師範学院経済管理学部講師)

### Reference

- 1) Xing tingmian. Concept and theoretical basis of animal husbandry ecological engineering [J]. Animal ecology, 1999, 20 (1): 33-37
- 2) Sun Zhenjun. Theory and application of animal husbandry ecological engineering [J]. China Agricultural Science and technology guide [J], 2001, 35:22-29
- 3) Meng Fandong, Li Sihong. Definition and characteristic analysis of animal husbandry eco economic system [J]. Dongyue Lun Cong, 2012, 33 (6): 137-139
- 4) Wang Guo. Experience and Enlightenment of foreign animal husbandry eco economic system development [J]. Heilongjiang Animal Husbandry and veterinary, 2019 (20): 25-27
- 5) Nan Ding, Xu Baizhi. Development experience and Enlightenment of grassland animal husbandry abroad [J]. Animal husbandry in China Industry, 2012 (17): 60-63
- 6) Wang Jimin. Foreign animal husbandry development model and Enlightenment [J]. China poultry, 2012, 34 (1) : 2-6.
- 7) Liu Zhiyi, Zhang Xian. Development trend and Enlightenment of modern animal husbandry abroad [J]. Feed-in China, 2014( 20): 36—39, 42.

- 8) Guan David. Study on optimizing the development of e-commerce of agricultural products in China by learning from foreign experience [J] Heilongjiang Animal Husbandry and veterinary, 2017 (06): 250-253
  - 9) Zhao Junfang. Integrated management model and experience enlightenment of foreign animal husbandry industry [J]. Heilongjiang Animal husbandry and veterinary medicine, 2017 (April 2): 40-42
  - 10) Zhao Xuejie. Study on the legal system of ecological animal husbandry in the Netherlands [J]. Heilongjiang Animal Husbandry and veterinary, 2020 (10): 28-32.
  - 11) Liu Yang, Zhang Xiaomei, Ma Qihui. Study on the development of ecological animal husbandry tourism in Heilongjiang Province under the strategy of Rural Revitalization [J]. Heilongjiang Animal Husbandry and veterinary, 2020 (18): 31-33.
  - 12) Zhou Ximei, Li Hao. Stock cooperative operation of animal husbandry villages and communities in ecologically fragile areas: why is it possible and possible—— Research and analysis based on ecological animal husbandry cooperatives in four provinces of Qinghai Tibet and new Mongolia [J]. Rural economy, 2020 (12): 120-129.
  - 13) Yu fawen, Huang Xin, Wang Guangliang. High-quality development of animal husbandry: theoretical interpretation and realization path [J]. China rural economy, 2021 (04): 85-99
  - 14) Su Wei, Xu Chuang, Yang Xueli, Wu Xiaohua. Study on the development countermeasures of ecological animal husbandry in China [J]. Heilongjiang Animal Husbandry and veterinary, 2021 (12): 16-21
  - 15) Li Ming, LV Xiaojian, Cao Jiajun, Tian Wanxia. Feasibility study on establishing ecological animal husbandry special zone in Sanjiangyuan National Park [J]. Journal of Qinghai University for Nationalities (SOCIAL SCIENCE EDITION), 2021,47 (01): 7-12
  - 16) Liang Ying, Yi Chenghong, Cai Chengzhi. Prospect of the global eco economic system - Understanding Based on the research track of eco economy. Anhui Agricultural Science, 2011.05:586-587
  - 17) Guiding Opinions of the State Council on promoting the revitalization of rural industries (GF [2019] No. 12), [http://www.gov.cn/zhengce/content/2019-06/28/content\\_5404170.htm](http://www.gov.cn/zhengce/content/2019-06/28/content_5404170.htm).
  - 18) Yu fawen, 2020: realization path of smart agriculture based on the concept of green development, people's forum · academic frontier, issue 24.Lin Yifu, Li Yongjun. Comparative Advantage, Competitive Advantage and Economic Development of Developing Countries[J]Management World, 2003(7): 21-28+66.
- Lin Yifu. Theoretical basis and development direction of new structural economics[J]. Economic Review, 2017(3): 4-16.

Acknowledgement: This manuscript is the first part of the survey and research results of Inner Mongolia Philosophy and Social Science Planning Project (2020NBD057) in 2020 ; is part of the survey and research results of Research Program of science at Universities of Inner Mongolia Autonomous Region (NJSY21028) in 2021 ; and at the same time is part of the Research on the Construction and Coordination Mechanism of Dairy Eco-economic Coupling System in the Yellow River Basin of Inner Mongolia(BSYHY202201) .