

# Feasibility Analysis of Landing Foreign Animal Husbandry Mode in China

## -- Taking Qinghai-Tibet Plateau as an Example

Yuqi Mao<sup>1, a</sup>, Keke Wen<sup>2, b</sup>, Xiaolu Wu<sup>3, c</sup>

<sup>1</sup>School of Foreign Languages, Shenzhen University, Shenzhen, China

<sup>2</sup>Geng Dan College, Beijing University of Technology, Beijing, China

<sup>3</sup>School of Journalism and communication, Shanxi University, Taiyuan, China

<sup>a</sup>francesca1016@qq.com, <sup>b</sup>2692364810@qq.com, <sup>c</sup>965670050@qq.com

### Abstract

In the long history, the Qinghai-Tibet Plateau of China is interdependent with its unique geographical location and climate environment and the traditional animal husbandry mode of life and production. However, the long-term uncontrolled development has caused many irreversible impacts on the local natural ecology. Therefore, from the formation source of the traditional animal husbandry production pattern at Qinghai-Tibet plateau to the new production pattern better adapted to the sustainable development goal, this study emphatically summarizes the advantages and disadvantages of several main animal husbandry mode abroad and the feasibility of their landing at Qinghai-Tibet Plateau. This study has certain reference significance and implication for the sustainable ecological development of Qinghai-Tibet Plateau in China.

### Keywords

Qinghai-Tibet Plateau; Animal husbandry mode; Sustainable development.

## 1. Qinghai-Tibet Plateau in History

"The history of a people can be explained by its location, topography, geological structure and climate." Herdsmen and herders who have lived in Tibetan areas for generations have to rely on nomadic survival because of their special geographical and climatic environment, which is the choice of local ancestors and local environmental conditions. In the long history, the formation of a local lifestyle is inseparable from its local natural environment, which is the result of mutual adaptation between local residents and nature for a long time. As the seasons change, cattle and sheep will spontaneously continue to look for pasture resources in other places in order to survive and forage after eating in one place. In this way, the original pasture will have enough time to develop lush, nutrient-rich pasture for cattle and sheep to graze on. This unconscious resource substitution behavior of cattle and sheep protects the grassland ecological resources and maintains the ecological balance. This makes the traditional animal husbandry production mode in use up to now. There are abundant grassland resources suitable for animal husbandry in Qinghai-Tibet Plateau. The grassland range of Sedge, Gramineae plants of the natural is wide, the area covered with soil. These include sedge family plants. Their grass is soft and has a high calorific value, with good palatability for livestock. The grass is low, lush and durable, which is suitable to be gnawed and trampled by cattle, Tibetan sheep and other livestock. Tibetan plateau has a unique artificial raising yaks and Tibetan sheep. They are high-quality species through the long-term strict natural selection with the severe cold environment of the Qinghai-Tibet Plateau. Survival of the fittest, they have become a veritable hardy breed,

with a strong ability to survive. Meanwhile, the meat of yak beef and Tibetan mutton is tender and rich in protein. No matter from its nutritional value, or edible taste, are the central Plains area of the common meat is far from reaching. Qinghai-Tibet Plateau is not suitable for the agricultural-ploughing industry specially developed in the central Plains, with agricultural disadvantages. The climate of Qinghai is characterized by severe drought in spring and abundant rainfall in summer and autumn. This characteristic of the climate undoubtedly causes crops to die of drought as soon as they are planted in the spring, and even if they survive the spring and summer, they will be drowned by sufficient rainfall when the autumn harvest comes. Crops could not grow in the area, while the climate does not affect pasture growth. A variety of advantages and disadvantages decided this area suitable for the animal husbandry.

## 2. Current Development of Animal Husbandry Production in Qinghai-Tibet

At present, there are many problems and contradictions in the development of animal husbandry in Qinghai-Tibet Plateau, which hinder the development of ecology, production and life in this region. The first is grassland degradation. Since the reform and opening up, with the improvement of living standards of Chinese residents, residents began to pay attention to the intake of nutritional value of food, the demand for beef, mutton, eggs and milk and other herbivorous poultry products increased year by year. This makes herdsmen need to further expand pasture and livestock scale. Meanwhile, the income of people in grassland areas is mainly derived from animal husbandry. With the increasing population of herdsmen on the grassland, herdsmen need to increase the scale of grazing in order to survive. As a result, overgrazing is inevitable, leading to serious grassland degradation on the Tibetan Plateau. Take the Sanjiangyuan region in Qinghai Province as an example, the grassland in this area is seriously aging. The grassland aged area of moderate or above is up to 10.323 million hm<sup>2</sup>, accounting for 35% of the total area of grassland aged in this region. The aging area of 2 million hm<sup>2</sup> has become "black soil beach". Scarred grassland ecological environment has been unable to support such animal husbandry mode. Doing so will only cause further damage to the ecological environment. Restricted by the ecological environment, herdsmen cannot develop animal husbandry, and their living standards cannot be improved or basically secured. To develop the economy is to overdraw the ecosystem, which in turn limits the development of production and life. This kind of mutual restriction contradiction, just reflect the malpractice that gives current animal husbandry mode. Seasonal imbalance of grass and livestock. Herdsmen used to divide the grazing time into warm season grazing and cold season grazing. Affected by the natural environment, the Qinghai-Tibet Plateau has a long cold season and a short warm season. At the same time, the quantity and nutrient supply of herbage in Qinghai-Tibet Plateau are different between the cold season and the warm season. That is, quantity and nutrient supply are scarce in the cold season and plentiful in the warm season. Therefore, in the peak season of pasture growth, it can meet the survival needs of livestock and even produce a surplus. During the off-season, when pasture production is low, the needs of herds are not met, leaving them in a state of semi-starvation or even starvation. Therefore, the imbalance between forage quantity and nutrient supply and livestock demand is a stumbling block to the development of animal husbandry, which reflects the shortcomings of the current development of animal husbandry.

Due to the low bearing capacity of alpine grassland, the temporal and spatial imbalance between supply and demand of grass and livestock, and the extensive operation mode of livestock husbandry, the production efficiency of grassland husbandry is low, the management efficiency of herdsmen is poor, and the alpine grassland degrades seriously.

In order to coordinate and promote plateau ecological protection, national park construction and regional livelihood improvement, it is urgent to transform and upgrade traditional grassland animal husbandry. In the research of Xu et al., in recent years, the strong support of national and local science and technology projects has optimized and improved the weak points of the alpine grassland animal husbandry system, such as low efficiency, high resource consumption and poor operating efficiency. In addition, research and development, application and demonstration of key technologies of ecological grass husbandry have been systematically carried out in Guinan County, Qinghai Province, which is located in the farming-pastoral crisscrossing area on the eastern edge of the Qinghai-Tibet Plateau. It integrates a technical system of improving quality and efficiency of ecological grass husbandry in alpine area with “appropriate use of grass husbandry in alpine area - artificial grass planting high quality and high yield - fine forage grass silage - series product processing - accurate allocation of forage material - livestock nutrition balance - deep processing of plateau-unique animal products - the 1st, 2nd, 3rd industries’ convergence - area function coupling”. It has actively promoted the transformation from traditional grassland animal husbandry to ecological grassland animal husbandry, and promoted the coordinated development of ecology, production and life in alpine regions. It will provide important scientific and technological support for the ecological protection of the Qinghai-Tibet Plateau, the sustainable development of grass husbandry, and the continuous increase of the income of herdsmen in the alpine region. At the same time, it has a certain implication for the adaptive management of typical ecologically fragile areas in western China and the ecological protection and high-quality development of the upper Yellow River. Similarly, Zhao’s research also reached the same conclusion. That is, China is in urgent need of carrying out relevant research on animal husbandry cooperatives to explore the governance structure matching the development status of animal husbandry cooperatives in China. Thus, an objective and effective evaluation method of animal husbandry cooperatives can be constructed to further enhance the positive role of animal husbandry cooperatives in the sustainable development of economy, society and ecology in China’s pastoral areas. In view of this, Zhao took 129 samples of animal husbandry cooperatives in Xiahe County, Hezuo City, Maqu County, Luqu County, Hongyuan County, Ruogai County, Henan County and Jiuzhi County in the alpine pastoral areas of the Qinghai-Tibet Plateau as examples to build an evaluation system of natural resource matching degree of animal husbandry cooperatives from the perspective of system coupling matching. Furthermore, the relationship between the governance structure of animal husbandry cooperatives and the matching degree of natural resources is analyzed theoretically and empirically in order to expand the thinking and direction of the research on animal husbandry cooperatives in China and make beneficial exploration for the further deepening of the research on animal husbandry cooperatives.

### 3. Main Foreign Animal Husbandry Production Mode

The United States mainly has large-scale factory livestock and poultry farming mode. It is characterized by large-scale, high level of mechanization, high capital investment, high technical content and high production efficiency. It is an intensive animal husbandry. Specifically, its land resources are abundant. For example, the Great Plains of the United States is vast and broad. It has a typical continental climate, rich water and grass, and grass-based vegetation. Therefore, cattle and sheep are allowed to roam freely at ordinary times, and calves and lambs are assigned to the original pasture according to their marks when they enter the harvest season. The US have stronger capital and technical strength while the labor force resource is not sufficient, so herdsmen develop animal husbandry with scale with mechanization means. Its production is concentrated. At the same time, the use of animal husbandry products (such as meat) processing storage, refrigeration transportation technology, livestock procurement trade, meat products sales and other related industries

developed. According to the market demand, Herdsmen use the improvement of herding methods, trial planting of grass, hybridization or introduction of high-quality animal breeds to produce marketable commercial cattle and mutton with high quality. It mainly adopts the contract mode of “company + peasant household”, combines distribution, production, supply and marketing, and constructs national market sales, with modernized business mode and socialized production service.

Australia mainly adopts the modern grassland animal husbandry mode, characterized by fenced grazing on the basis of natural or artificial grassland. Relatively, animal husbandry production activity and ecological resource condition are more harmonious. Adoption of this mode depends on its natural condition above all. Australia has more natural grassland per capita than any other country in the world. And the climate is mild, groundwater resources are rich and have wide coverage, providing animal husbandry water. After the initial stage of extensive development of animal husbandry, fence grazing technology was used, which was embodied in different grazing gradients in different locations. Herdsmen can divide the area and range of the fence before grazing, and the grazing stage can be adjusted scientifically, so as to achieve the balance between animal husbandry production and grassland fertility, and promote sustainable development within the limits of environmental bearing capacity. In some areas, herdsmen also adopt the farming method of mixed rotation of animal husbandry and planting in accordance with local conditions to realize the transition from traditional animal husbandry to mixed farming mode of grass husbandry. It also focuses on improving and developing quality pasture varieties. The government uses policy subsidy, disguised support and other means to support animal husbandry. Moreover, dozens of animal product quality standards have been formulated to strengthen the quality and safety of animal products, in order to create a good policy environment for animal husbandry and to provide international competitiveness of animal products. Australia adopts the industrial mode of “family ranch + professional cooperative + professional cooperative enterprise”, and its professional industry association is responsible for all links of livestock product circulation. This not only reduces vicious market competition, but also makes scattered herdsmen gathered, so it has higher productivity and market matching degree.

Denmark, in northern Europe, uses a new mode for managing livestock and poultry production on a moderately large scale. The mode reflects the characteristics of moderate production scale, combination of agriculture and animal husbandry, and friendly to the environment. Denmark has a maritime climate, which is suitable for the growth of forage crops such as herbage, and the labor resources are basically balanced. It not only solves the problem of feed but also realizes the high efficiency of land use. Animal husbandry is the backbone industry of Denmark. Exports of livestock products such as pork, cheese, butter, grass, milk, and seeds are huge and the market supply is large. Its agricultural science and technology development is still booming in the world, among which the agriculture, animal husbandry and grain industries are relatively high in science and technology. Denmark is also the world's largest importer and exporter of aquatic seeds. The number of animals produced on a unit farm or ranch is regulated. When it reaches half of the prescribed quantity, it is evaluated whether it can expand production. Therefore, the sustainable land can be kept, and the sustainable production of pasture land can be promoted, with coordination with the environment. Denmark vigorously promotes pollution-free feed with less phosphorus to reduce environmental pollution. Also, policy states that livestock waste should not be discharged into the water but into fields and meadows. The government formulates scientific manure transportation subsidy plan to surplus manure. Herdsmen are encouraged to ferment and process them into organic fertilizer to form a circular farming and animal husbandry mode. Denmark uses a cooperative mechanism in the form of a company. Cooperatives serve farmers or herdsmen, represent their interests, and are highly organized.

## 4. Conclusion and Implication

Although the long history of unrestrained development of traditional animal husbandry at Qinghai-Tibet Plateau in China has caused irreversible damage, but we can still start from the current situation and the goal of sustainable development, adopt excellent and suitable animal husbandry production mode at home and abroad for reference comprehensively, to improve and restore the Qinghai-Tibet Plateau area in China. This study mainly analyzes the feasibility of several major foreign animal husbandry modes to be introduced into Qinghai-Tibet region of China. Among them, animal husbandry represented by the United States, Australia and Denmark adopts different industrial modes, which have their own characteristics and reasons. The experience of these national modes should be adapted to local conditions when applied specifically to China's Qinghai-Tibet Plateau region. The ecology of Qinghai-Tibet Plateau is fragile, so animal husbandry should take grassland protection as the goal and rationally develop and utilize grassland. The government can develop ecological grassland animal husbandry by means of grass-fixed livestock and enclosure feeding, and establish herdsmen's consciousness of grassland ecological benefit being the top priority. The government should also strengthen infrastructure construction to improve production efficiency, strengthen the deep processing of livestock products, and improve the industrial chain and system. Thus, the level of organization and industrial development can be improved to develop profit-oriented grassland animal husbandry. These are of far-reaching significance to the ecological restoration and sustainable development of the Qinghai-Tibet Plateau in China.

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