Dairy Goat Production in China
Dr. Jun Luo
Northwest Agriculture and Forestry University
Yangling, Shaanxi, China

Introduction
Goat is one of the most extensively distributed domestic animals in the world, the number of dairy goats in the developed and developing countries accounted for 30.9% and 19.1% of the total goat population, respectively (Olivier et al., 2005). The development of dairy goat industries depends on the competition with cow milk production. Although dairy goat products are generally in specific markets, their profitability and competitive advantage affect their relative price and unique organization of the goat production system. Most of the world human population in developing countries has access to goat milk, a survey shows that probably less than 5% of the total milk is traded, thus, the statistical data may not display an exact view of the economical importance of this sector, and goats in the developing regions in the world played a significant roles in food and economic security, research on dairy goats increased in recent years, so does it in China. Dairy goat production in China demonstrated a great perspectives, the paper will summarize the dairy goat production of China to provide information for the goat producers and scientists involved in the small ruminant research.

History Of Dairy Goat
With the long history of goat rearing, China has the rich resources of goat breeds and ranked the first in the total number of goats. According to the Annals of Sheep and Goat Breeds in China (Compiling committee of Annals of Sheep and Goat Breeds in China, 1989), there are 23 goat breeds in China, in 1995, Nan Jiang Huang goat was recognized as the first new meat goat breeds with the best meat performance in China after evaluation of China Agriculture Ministry (Pu et al., 2002), therefore, at present, the total number of goat breeds in China increased to 24 breeds including dairy, meat, cashmere, skin and dual purposes goat breeds, besides, 25 local goat breeds and imported goat breeds were not listed in the Annals of Sheep and Goat Breeds in China (Xu et al., 2003). Due to the vast territory and diversified ecological conditions in China, the distribution and production of goats characterized by the distinctive regional patterns, dairy goats were reared mostly in the rural area, cashmere goats centralized in the cold mountainous region of northern China, meat goats distributed extensively in various climatic and geographic conditions.

Although the goat had been raised in China for thousands of years and people used milk from local milking goat as food, the commercial dairy goat production is more or less 100 years. At the beginning of 20th century, the war-torn China was not able to develop the animal husbandry, much less dairy goats. It was recorded that in 1920's missionary of Christian and Catholic church from Europe and United States of America brought along the goats for their own consumption, meantime, the bucks were used for the crossbreeding with local goat to improve the production level, and smallholders in the goat-keeping area started the selection themselves, with the increase of milk production, the dairy goat industry was gradually formed. After 1949, Chinese government took a series of measures to develop the animal husbandry, the dairy goat industry has grown rapidly since then, and the number of dairy goats increased from 170,000 in 1949 to 3.22 million in 1988, milk production from 17,700 ton to 529,000 ton accordingly, the annual growth rates averaged 7.8% and 9.2%, respectively. From 1989, the dairy goat in China developed steadily with a moderate increase, the rapid growth of dairy cattle industry restricted the dairy goats development to some extent especially in the relatively developed regions, the shift of production purpose i.e., milk or meat affected the dairy goat industry
as well, however, the functional goat milk received the consumers attention in last few years, the dairy goat industry was revitalized and the number of dairy goat increased to nearly 5.8 million in 2008.

Dairy Goat Numbers And Distribution

It is estimated that total goat number in China is 21.7% of the total goat number in the world (Olivier et al., 2005), and the goat number and gross production in China rank the first for many years. The statistics on goats are not very reliable since they are generally not based on the actual census, and the numbers of dairy goats are even more difficult in this aspect due to definition and the changing of subsidy policies etc. According to the latest production data, there are now approximately 5.8 million dairy goats in China which mainly distributed in Shaanxi, Shandong, Henan, Liaoning, and Hebei province etc., as the biggest dairy goat production base in China, Shaanxi province kept 2.4 million goats in 2007, and 30% milk of this province was from dairy goats. The dairy goats had been extended to 28 provinces of China, the concentration in the several provinces is evident, the regions producing large amount of grains kept most numbers of dairy goats, the number of goats in each province do not reveal the importance of goats in some areas because the regional difference was not considered within provinces, for example, dairy goats in Shaanxi province are mainly in Weinan prefecture where dairy goats are the important income source of farmers. In the southern provinces such as Guangdong, Fujian, and Zhejiang, the higher fresh goat milk consumption resulted in a seasonal characteristics of dairy goat production, the milking goats were trucked to the south in the spring from northern provinces, the milk was sold at a higher price, all goat will be slaughtered in the beginning of winter after the lactation, this production model was considered as short-sighted measures of animal husbandry, therefore, the numbers of dairy goats in southern China are quite small.

Dairy Goat Breeds

The number of dairy goat breeds including Saanen, Toggenburg, and Nubian was introduced into China since 1920’s and has been kept successfully, so far, various breeds of dairy goats had been officially recognized, but the main dairy goat breeds are Xinong Saanen dairy goats, Guanzhong dairy goats, Laoshan dairy goats, Henan dairy goats, Yanbian dairy goats etc., all breeds are white and short haired animals.

Xinong Saanen dairy goat

The leading high producing dairy goat breed in China, this breed was selected from a small herd of Saanen goat imported from United States of America in 1936 by Chinese National Association of the Mass Education, the goat herd was soon forced to move to Northwest Agricultural College (currently the Northwest A&F University) in Shaanxi province following the breakout of anti-Japanese war, the systematic selection of dairy goats started from 1944 by famous professor Liu Yingwu, Xinong Saanen dairy goat was formally recognized in 1981. Typical dairy conformation and high milk production attracted the great attention of producers, the large body size manifested by the “4-long” characteristics, i.e., long-head, long-neck, long-trunk and long-leg. The milk yield in 300 days lactation period averaged over 800 kg (1,762 lbs) with the highest daily milk yield of 10.8 kg, the milk fat, protein and dry matter percentage are 3.43%, 3.28%, and 11.40%, respectively; kidding rate is around 200% with dominant twins and triplets, the high quality bucks and does can be used up to 9 or 10 years old. Xinong Saanen dairy goats can adapt extensive climate in China, though the regions between the north of Yangtze River and south of Yellow River have the best climate conditions for efficient production.

Guanzhong dairy goat

With the largest population in China, Guanzhong dairy goat was crossbred by Xinong Saanen dairy goat and local white goat since 1970, the breed was officially approved by Breed Evaluation Committee of Shaanxi province in 1990. The breed mainly distributed in the central area of Shaanxi province and had
been sold to 20 provinces of China. Due to the similar genetic background, the conformation of Guanzhong dairy goats looks like Xinong Saanen dairy goats with only a little smaller body size. The milk yield in 280 days lactation period ranged between 400 kg to 700 kg (881 to 1,542 lbs), the milk fat, protein and dry matter percentage are 3.50%, 3.52%, and 12.90%, respectively; kidding rate is around 178%. All milking goats were culled for meat purpose with the average dressing percentage of 45.5%. The breed could adapt the harsh conditions and display the strong resistance to common diseases.

Laoshan dairy goat

Laoshan dairy goat distributed in Jimo, Qingdao, and Yantai areas of Shandong province where the rich natural and feeds resources provide the superior conditions for dairy goat, this area has the longest history of dairy goat-keeping. At the beginning, the Saanen goats brought by preachers crossbred with the local small-sized white goats, the Laoshan dairy goat was gradually formed after many years selection for high milk production and large body size, this breed was officially approved as the dairy goat breed in 1991. With the compact and strong conformation, Laoshan dairy goats are white-haired with a large percentage of hornless, the milk yield in 270 days lactation period ranged between 450 kg to 800 kg (991 to 1,762 lbs), the milk fat percentage is around 4%, kidding rate is around 170%. Laoshan dairy goat demonstrated the better adaptability to the humid climate conditions.

Dairy Goat Rearing And Management

In China, dairy goat feeding is quite extensive to minimize the costs, the main production models are as following:

Tethering system (partly grazing)

The dairy goats are mostly kept in the agricultural production areas with limited pastures, local farmers have a long-standing traditions of keeping dairy goats either for home consumption or making money, each family usually possess 1 to 5 milking goats, children and elders often take care of goats, the tethering dairy goats browse the grass on the ridge of the field while farmers work in the cropland, this is the most popular and low cost way of keeping dairy goats, which is suitable for the small scale production. The disadvantages of partly grazing system are the contradiction of destroying trees and crops and death caused by inappropriate rope setting.

Goats in this system depend solely on the grass in the late spring through fall, high producing does may be supplemented with corn and wheat bran mixture in the peak lactation during the summer time; goats receive small amount of concentrate mixture except for the corn stalks and crop residues during winter and early spring, few smallholders store the roughage for dairy goats whole year. Family kitchen wastes were fed sometimes in the production system, but the caution must be exercised.

Confined system (zero grazing)

With the growing dairy goat business, the confined feeding system emerged to meet the requirements of large scale and intensive production, the numbers of large scale dairy goat farms increased significantly in recent years, the average herd size for each smallholder is about 30-50 goats, the record-keeping and breeding plans could be implemented in the farm to improve the milk production of does. With the concomitant increase of herd size, the machine milking stations were constructed in the village to milk goats to make sure the milk quality, this system is beneficial to controlled mating, disease control, and high milk yield etc., however, the investment for such system was relatively higher, and the feeding and management are more labor costing.
The main roughage for the dairy goats includes corn silage, corn stalks, peanut vine and bean stalk and pod etc., the roughage needs to be stored for winter use, concentrate mixture must be supplemented all year around to obtain the higher productivity.

**Milk Processing**

The total goat milk production constitutes 4% of China’s total milk production. Per capita milk consumption of China in 2007 is 27.9 kg (61.5 lbs) which was significantly lower than the annual milk consumption in the world (100 kg = 220 lbs), and even lower than that of developing countries (40 kg), therefore, the Chinese dairy industry and milk market still have a great development potentials, many years experience of dairy enterprises in China has proven that dairy cattle production can not provide adequate milk without the dairy goat industry, goat milk is an important supplement of dairy production, particularly for the residents in underdeveloped rural area and hilly mountainous region, rearing dairy goats can efficiently increase the farmer’s income and improve the nutrition status of people and finally realize the strategic objectives of poverty alleviation.

At present, the goat milk in China was mainly used to produce milk powder and drinking milk, very small amount of goat milk was used for cheesemaking in the pilot dairy plant or institute, you hardly find other forms of products from goat milk. The lack of diversified goat milk products also affected the dairy goat industries and the development of goat milk products suitable for Chinese consumers are needed in the future dairy goat industry in China. However, in the last few years, with the further understanding of medical function of goat milk, consumers have gradually accepted the goat milk and its products, minority of investors had turned their attentions to the industrialization of dairy goat production and development of new milk products.

**Research And Extension**

Since 1970, different funding agencies in China had funded a number of projects in dairy goat research and extension covering the broad areas of nutrition, breeding, reproduction, milk processing, disease control and management etc., the ongoing projects for dairy goats are listed as it follows:

- Construction of Reproductive Breeding and Production Technology System for Dairy Goat Industry in China, funded by China Ministry of Agriculture;
- Network Analysis of Genes of Fatty Acid Metabolism in Mammary Gland of Dairy Goats, funded by China Ministry of Science and Technology;
- Research and Demonstration of Efficient Ecological Feeding Technology of Dairy and Meat Goats, funded by Department of Science and Technology of Shaanxi Province;
- Study on key Technology of Feeding and Management of Dairy Goat Kids, funded by Department of Science and Technology of Shaanxi Province.

Meantime, the extension works are very active, extension specialists and professors gave the scheduled training lectures to farmers and technicians, several breeding farms of dairy goat are responsible for the supply of high quality semen and breeding stocks. Due to the wide involvement of family members in the dairy goat production, a similar goat extension program as in United States of America should be developed in China to accelerate the pace of industrialization of dairy goat.

**Prospects**

Dairy goat production in China had been stabilized for number of years, in last few years, due to the favorable goat milk market, dairy goat industry received unprecedented attentions, highly productive dairy goats were used to crossbreed the native goat for dual purpose production, dairy goat industry gradually increased with the growing numbers of large scale farms and got on the right track of sustainable develop-
ment, however, we must keep a clear mind to the problematic issues in the development process of dairy goats, and the attention should be paid to the ecological environment protection, reasonable utilization of goat feed resources, increase of the feeding and management, improving of individual production performance, adjustment of production mode and varieties of goat products, competitiveness in the consumer market, and finally make China goat industry a sustainable animal agriculture with great emphasis on economic, social, and ecological benefits.

References


