CURRENT STATUS AND CHALLENGES OF DAIRY GOAT INDUSTRY IN VIETNAM

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ABSTRACT

In Viet Nam total goat population being more than 2.8 million heads in 2023, which is widely raised and promoted in both the South and the North. However rapid goat population development is mainly for meat production, while this is modest for dairy goats. There are number of goat farms for milking in the urban areas or in the villages, milk and milk products are sold in towns or cities with a very small amount, while this is ignorant in remote villages with the lack of milk consumption for children and old people. In large farms goat breeds raised for milk are pure Saanen and Alpine, while in small farms Bach Thao goats and crossbreds (Saanen x Bach Thao) are kept due to their good adaptation to the limited conditions of nutritive value diets, warm climate, housings and diseases. Average milk yield of the pure Saanen or Alpine is around 2.0 L/day, while the crossbreds and Bac Thao is about 1.5 L/day. Studies on dairy goat are mainly feeds, nutrition, breeds and breeding, reproduction and milk processing. Even so there are also numbers of integrated models of dairy goat farms associated with innovative milk products, tourism and education for children, which could thrive in the urban areas and villages for increasing benefits. The farm sizes in Vietnam are less than 500 heads in an unit. While milk and milk products are spontaneously processed, marketed and sold in limited local markets. The challenges to the development for dairy goat industry in Viet Nam are limitations on small farm sizes, lack of the investments on finances, scientific research, international-local collaborations and milk product processing facilities. The conclusion this paper is that there are many opportunities for great potential development of dairy goat due to increasing demands of milk products and better quality of goat milk, and to overcome the above challenges the investments of suitable farm size, better marketing and modernized processing plants are necessarily improved under the international development context.

Keywords: *Challenging, development, milk production, small ruminants, studies*.

INTRODUCTION

In the world, cow dairy plays an important role for human food. However, goat dairy developed rapidly in the past decades worldwide, as well as in China (Landbouwteam China, 2019). Goat milk is an excellent source of protein, calcium, potassium, phosphorous, magnesium and vitamin A and may be easier to digest because the fat globules are much smaller and easier on the digestive system. It is naturally homogenized, which means it is uniform and the fat molecules are less likely to float to the top (Metzger, 2022). In 1980s dairy goat production developed very well for local consumption, due to lack of imported milk from foreign countries and dairy cattle production. However, when the imported milk sources being abundant and dairy cow production developed, the producers had a trend to produce more meat goats. The estimated dairy goat population is also increased with the moderate amount of 2.0 -5.0% of the total goat population and dairy goats were raised in both small households and intensive farms (Do Thi Thanh Van and Nguyen Van Thu, 2018) due to the increasing price and consumption of goat milk and meat in the whole country. Then dairy goat production has been paid more attention by farmers and government agencies in number of provinces for improving income as well as reducing the risks of serious diseases of pigs and poultry.

The successful studies on breeds and breeding, nutrition, feeds, supplements for Saanen, Bac Thao and crossbred goats (Saanen x Bach Thao) have been reported (Truong Van Hieu et al.,

2018). Because of the impacts of climate change the studies on greenhouse emissions mitigation have been done. Although goat milk was really necessary for the child growth and the health of old and sick people in rural poor areas, the dairy goat population development is limited. The meat goat production is widely encouraged and developed in the whole country, while dairy goat giving more profits for both milk and meat, which is ignorant. The development of dairy cattle industry has been very rapid to produce many milk products for both domestic markets and exports, this is less developed for the goats, even though number of dairy goat farms in Hau Giang, Tien Giang Long An and Lam Dong provinces profitably develop. While international dairy goat production is well-profitably developed, particularly in China, New Zealand, Spain, Indonesia, etc. In Vietnam with better development of economy, tropical feed resources from agricultural by-products available for ruminants and good quality milk and milk products demand being high for both cities and rural areas, the dairy goat production could be necessarily developed. Therefore in this report the current status, challenges and some measures for improving the dairy goat production under international context are discussed.

INTERNATIONAL CONTEXT OF DAIRY GOAT PRODUCTION

The global dairy goat population was estimated to be 218 million in 2017 (FAO, 2019 and Beth and Christopher, 2019), while it was 1.22 million heads in 2022 in China (Textor, 2023) and 410 thousand heads in USA in 2022 (USDA, 2022). The percentage of the dairy goat over the total goat population in USA is about 20.0%. Goat milk production develops well with high demand from year to year. It was also reported that the 6th Asian-Australasian Dairy Goat Conference was held in Yangling, China, from November 20 to 24th, 2024. This conference, themed "Green Dairy Goat Farming for Better Milk" has attracted over 170 experts, scholars, business professionals, and industry representatives from 10 countries around the world. They gathered to discuss the latest research findings and future development directions of the dairy goat industry successfully. The Conference was organized into five scientific sessions, such as Genetics, Breeding and Reproduction, Feeding and Feed Resource Exploitation and Utilization, Disease Control of Dairy goat, Goat Milk and Dairy Product Processing and Lactation and Mammary Gland Development. Representatives from countries in the Asian-Australasian region presented reports on the current status and trends of their respective dairy goat industries. Experts, scholars, and professional representatives from both domestic and international dairy goat fields shared the latest research findings and industry developments from different perspectives during the conference. The participants were also visited some goat milk processing plants, dairy goat breeding center and dairy goat farms in Yangling, China, and also witnessed the Signing Ceremony between Qianyang Dairy Goat Breeding Center of China and Agro Sindo International Company of Indonesia for providing pure breeds and frozen Saanen semen to improve the breed quality of dairy goats in Indonesia.

Fig 1. The whole participants of the AADGC 2024

Fig 2. Signing Ceremony of Agreement on dairy goat breeding

GOAT POPULATION AND BREEDS

The total goat population in Vietnam in 2023 was 2.835 million heads with the annual increase of 1.44% from 2019 to 2023 because of some incentives from prices and development policy. However, the estimated dairy goat population is only around 3.78% of the total goat population, and was about 104.6 thousand heads with small annual increase of 0.37%, while dairy cattle population increased about 1.0%. For pig and chicken population was 30.1 and 554. 4 million with the annual increase of 4.76 and 2.57%, respectively.

Table 1. The Annual change (%) of livestock population in Vietnam from 2019-2023

Item	2019	2021	2023	Annual change, %
Buffalo (mill. head)	2.388	2.623	2.136	-1.76
Cattle (mill. head)	6.278	6.339	6.331	0.14
Dairy cow (thous. head)	317.700	326.800	336.600	0.99
Goat (mill. head)	2.609	2.678	2.835	1.44
Dairy Goat * (thous. head)	102.3	102.8	104.6	0.37
Pig (mill head)	23.378	28.160	30.060	4.76
Chicken (mill. head)	480.3	524.1	554.4	2.57

*Source: Dept. of Animal husbandry (2024), Do Thi Thanh Van & Nguyen Van Thu (2018) adapted by Nguyen Van Thu (2024), * estimated figures*

In Vietnam the dairy goat breeds mainly raised are the local Bach Thao, Saanen, Alpine and crossbred (Saanen x Bach Thao). In the larger farms Saanen and Alpine breed are essentially kept, while the Bach Thao and the crossbred breeds are raised in small farms in the villages due to easy feeding and disease control, and adapting to local available feed sources and the climate.

Fig 3. Alpine breed raised in Vietnam

Fig 4. Saanen breed raised in Vietnam

MILK AND MEAT PRODUCTION

The average milk yield for the 2nd lactation of Saanen does (7 months) was 1.46 litter/day stated by Truong Van Hieu et al. (2016), however this was 2.04 litter/day in 2024 in the same farms. The milk production was improved by individual selection of better milk-producing does, improved nutritive diets and live weight of does (around 40 kg) at the first mating. The milk yield of the local Bach Thao and crossbred goats was not clearly improved due to their dual purposes with the meat goat price being still high in the markets. However it was from 1.0 - 1.50 litter/day and the milk composition (%) was 11.5, 3.78, 2.97 and 4.50 for the total solid, fat, casein and lactose, respectively. In cases the crossbred goats were produced with the meat goat breed Boer. In number of dairy goat farms the meat production from male goats also contribute a significant income beside milk and milk products.

STUDIES ON LOCAL FEED AND SUPPLEMENT SOURCES AND GREENHOUSE GAS (GHG)

Number of studies on dairy goats were implemented to explore the new feed sources such as flood tolerant grasses, dragon fruit branches, local legume leaves and vines, agro-industrial by products, etc. to increase the goat number in farms, nutritional improvement and increased milk production.

Fig 5. Goats fed *Sertaria sphacelata*

Fig 6. Goats supplemented *Operculina turperthum*

The reduction of GHG emissions of small ruminants (goats and sheep) is also considered to implement for the *in vitro*, *in vivo* and performance experiments with promising applications in practices. Essential oils, additives, probiotics and total mixed ration (TMR) have been applied in the small ruminant diets.

Table 2. Tra fish oil reducing CO_2, CH_4 and CO_2eq production of crossbred goats

Item	Treatment				±SEM	P
	NS	CONC	TMR	TMR+TFO		
CH_4, L/d	9.44^b	11.2^a	11.3^a	7.75^c	0.166	0.001
CO_2, L/d	177^a	207^a	198^a	133^b	7.27	0.002
CH_4, L/kgDMI	18.8^a	18.4^a	18.5^a	12.6^b	0.893	0.007
CO_2, L/kgDMI	350^a	340^a	323^a	216^b	10.1	0.001
CH_4, L/kgDWG	134^a	111a^b	102^b	54.4^c	5.69	0.001
CO_2, L/kgDWG	2,498^a	2,048^b	1,773^b	934^c	90.5	0.001
CO_2eq, L/kgDWG	6,245^a	5,152^b	4,629^b	2,458^c	210	0.001

NS: 50% Para grass and 50% cabbage waste; CONC: 40% Para grass, 40% Cabbage waste and 20% Concentrate; TMR: 40% Para grass, 40% cabbage waste, 20% concentrate and TMR+TFO: TMR + 3% Tra fish oil (%DM). DWG: daily weight gain; DMI: dry mater intake; CO_2eq: CO_2 equivalent.

Source: Le Van Phong and Nguyen Van Thu (2024)

CHALLENGES OF DAIRY GOAT INDUSTRY

In recent years dairy goat population development has been slow and the farm size have been still small under 500 heads and located in villages. Even though they have actively produced many commercial milk products aiming to promote the Vietnamese to consume more goat milk and products. The investors for both large farm sizes and milk processing factories are needed for improving the problems, while the developing projects, widen markets, international collaborations and improved technologies for feeding dairy goats are also necessarily realized.

Fig 7. Integrated farm of dairy goat, tourism & education

Fig 8. Goat milk powder

Fig 9. Dry goat yaourt

CONCLUSIONS

It was concluded that dairy goat production in Vietnam has a great potential of development due to the increase of human demand and income, while suitable climate, local feeds, labors and good breeds are available and for raising. However its industry is facing the challenges of available investments, larger farms and better milk processing plants. Domestic and international collaborations are also needed to develop feeding technologies, suitable projects and markets.

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