

Role of Livestock Production in Farm Households' Economy and Challenges in Perspective of Sustainable Development

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INTRODUCTION

Livestock production sector plays an important role in the socio-economic development of Vietnam (it represents about 30% of agricultural GDP). In the period of 2011-2015, the livestock sector has a high growth rate, about 4,5-5% annually. In 2015, the total value of livestock production of the nation is about 205,44 thousand billion dongs. Pigs, poultry, and dairy cattle production have grown rapidly over some last years (annual growth rate of pork, poultry meat, egg, and milk production from 2011-2015 were 2.7%; 10%; 7.56%, and 22.1%, respectively). The animal-origin products meet basically the domestic consumption demand, some products even were exported to other countries (Hoang Thanh Van, 2016). In 2013, Vietnam had exported about 40,000 tones de pork (Statica, 2016). Livestock production not only provides enough food for domestic consumers demand (at least 10% of per capita calorie intake of consumers provided by livestock products), but also generates employment and income for a high number of farmers in rural areas (about 6.5 million households or 42% total households in rural areas engaged in livestock production, and shares about 14% in total household income) (Lucila Lapar, Ma., 2015). In the coming years, livestock production sector in Vietnam will be projected to rise due to the rapid increase of consumption demand in the domestic market. However, there will be certainly the ignore difficulties for its development in term of sustainable development.

Livestock Production in Vietnam in the last decade

The livestock production sector in Vietnam is much diversified with the development of different livestock species, including pigs, poultry, cattle and others. In recent years, due to the rapid growth of the economy, the livestock production has been developed significantly to meet the increasing demand of domestic consumption. However, the development of livestock production sector is effected by many external and internal factors and changed slightly over some last years. The changes have seen in not only population of livestock herds, but also the production scale of animal farms. Figure 1 and 2 show the variation of population of pig, buffalo, cattle, and poultry over some last years. Figure 3 and 4 indicate the variation in meat production and consumption in the last decade.

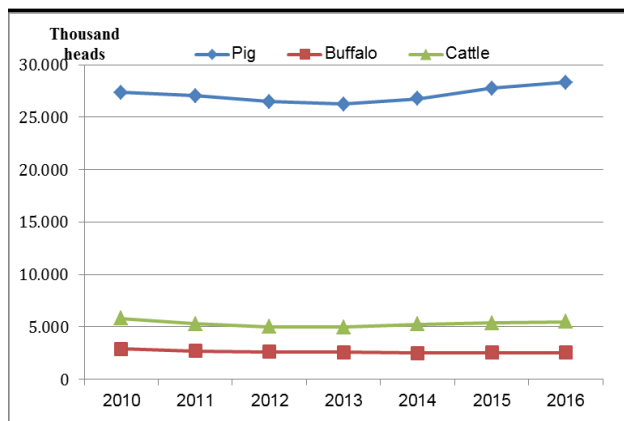


Figure 1. Changes in population of some livestock herds from 2010 to 2016

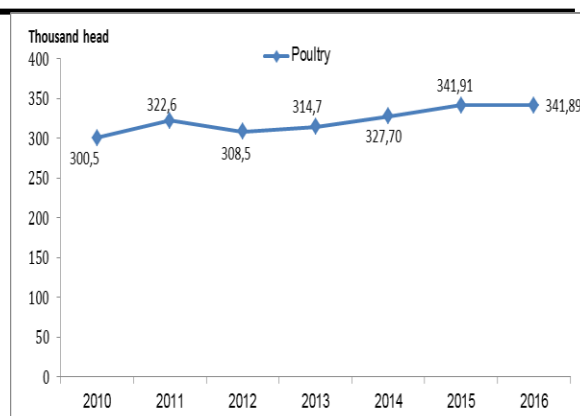


Figure 2. Changes in population of poultry herds from 2010 to 2016

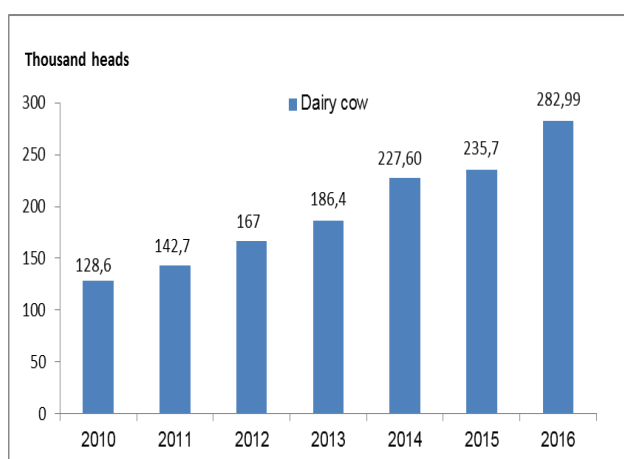


Figure 3. Changes in population of dairy cattles from 2000 to 2016

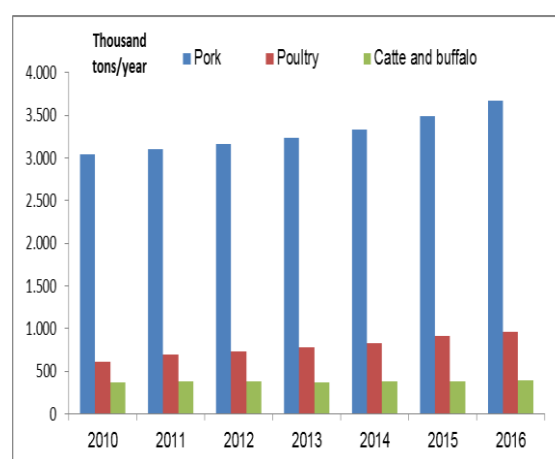


Figure 4. Changes in meat products over the last years

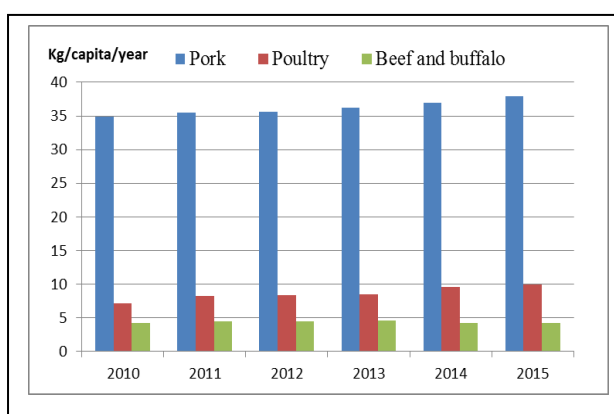


Figure 5. Changes in average meat consumption per capita per year

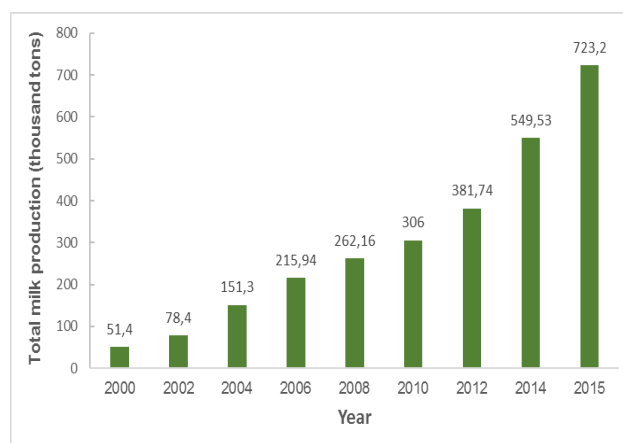


Figure 6. Changes in fresh milk products from 2000 to 2015

According to figure 1 and 2, the population of livestock herds (pig, cattle, buffalo and poultry) has varied slightly over some last years. The pig population varies about 27,000 thousand heads, cattle population is about 5,000 thousand and buffalo one decreased from about 2,900 thousand to about 2,500 thousand from 2010 to 2015. However, dairy cattle and

poultry populations have been increased considerably: from 300,000 thousand to more than 340,000 thousand heads in 2010 in 2015 for poultry population, and from 128.5 thousand heads to 275.3 thousand heads in the same period (more than 2 times in 5 years) (Figure. 3).

The pork production has risen from 2.012 thousand tons per year in 2010 to 3.491,6 thousand tons per year in 2015 (Figure 4). The statistical data indicates that pork is one of the most important types of meat in Vietnam with the average meat consumption per capita per year risen from 15.1kg live weigh in 2010 to 37.9kg in 2015 (Figure 5), sharing 72.67% of total consumed meat in the market.

The growth of dairy cattle population has created the very high increasing of fresh milk production. The milk quantity produced has been increased from 51.4 thousand tons in 2000 to 723.3 thousand tons in the year 2015 (near about 15 times).

Characteristics of livestock Production systems and its role in Farm Households' Economy

a) Small scale of animal production

Almost of households in countryside practice animal production (48% of farm households raising pig and 91% households raising chickens) (GSO, 2016). Animal production is mainly practiced in farm household at small scale (Table 1 and 2).

Table 1. Structure of pig farm households' size by ecological regions

	Total		% of HH			
	Pig population (1000 heads)	%	1-5 pigs/HH	6-9 pigs/HH	10-49 pigs/HH	≥50 pigs/HH
Whole country	4,131,513	100	77.54	8.89	12.79	0.78
Red river delta	870,504	21.07	72.00	7.59	19.46	1.21
Northern midlands and mountain areas	1,204,391	29.15	80.24	10.02	9.46	0.28
North Central and Central coastal areas	1,238,887	29.99	85.02	7.71	7.04	0.23
Central Highlands	210,796	5.10	74.50	9.73	14.93	0.84
South East	110,075	2.66	43.16	10.63	38.87	7.34
Mekong River Delta	496,860	12.03	71.44	10.63	16.81	1.12

Source: GSO, 2011

The proportion of pig farm households' size having less than 10 heads represents about 87%, and for households raising more than 50 pigs represent only 0.78% of total pig farm households. The small swine farms are mainly in the North and Centre of Vietnam. In the Southern provinces (South East and Mekong Delta) the scale of farm is larger.

Table 2. Structure of chicken farm households' size by ecological regions

	Total		% of HH			
		%	1-49 chickens/HH	50-99 chickens/HH	100-999 chickens/HH	≥1000 Chickens/HH
Whole country	7 864 730	100	89.60	7.16	3.03	0.21
Red river delta	1 785 463	22.70	86.89	8.41	4.32	0.38
Northern midlands and mountain areas	1 726 313	21.95	86.68	9.18	3.93	0.21
North Central and Central coastal areas	2 243 199	28.52	91.47	6.38	2.10	0.05
Central Highlands	527 392	6.71	91.58	5.95	2.32	0.14
South East	398 841	5.07	88.30	8.33	3.07	0.31
Mekong River Delta	1 183 522	15.05	93.96	3.93	1.84	0.27

Source: GSO, 2011

For chicken production, it's the same situation as swine production. The number of chicken farm households at large scale is very small. That means the households raising chicken aim to be auto-consumption more than for the market. However, one of the most remarkable changes in livestock production in Vietnam over some last years is the intensification and rapid development of large-scale farms. The statistical data indicated that over the last years, the number of pig farms with less than 10 heads of pigs has reduced 2.2 million farms (equal to a reduction of 38.5% in the total pig farms) from 2006 to 2011. On the other hand, the amount of medium-scale farms (with a pig herd size of 10 to 49 heads) and large-scale farms (with more than 50 heads of pigs per farm) has an increase of 3.4% and 80%, respectively (GSO 2012).

The trend in poultry production is also similar to that of pig production. The number of large-scale farm (with more than 1000 heads of chicken) in 2011 was 16.6 thousand farm, equal to 4.32 times higher than that in 2006 (GSO 2012). Besides, we assist a dual-pole in animal farm development. The small farm rate represents a very high proportion but we also assist the existing of very large farms (mega-farms). These farms have about tens of thousands of cows (TH True Milk, Vina milk) or several hundred thousand of laying hens (DTK),...The very large farms belong to the big companies or groups which are operating in other fields (wood processing and exploitation, daily goods production, or trading).

b) Developing integrated farm households and role of animal production in households' economy

The Vietnamese peasants are mainly practicing agriculture at very small scale (about 0.25 ha/HH in Red River Delta and 0.5 ha in the Mekong delta), that's why, they generally having many economical activities (crop production, animal production, aquaculture and off-farm activities). These activities are carried out in the integrated systems (Table 3).

Table 3. Diversification of farming systems *

Farming Systems	Sub-Systems	Characteristics	Number of surveyed farms
FS1: Vegetable cultivated crops systems	FS1a: Specialized vegetable crops system	Specialized in carrot, maize and some other crops Large (10-30 sao ^{**} /farm HH) and medium scale (5-10 sao/farm HH)	15
	FS1b: Specialized vegetable crops with animal and fish production system	Crop rotation of carrot, maize with animal and fish production Medium scale: 5-8 sao of carrot and 5-10 sao of fishpond, 10-20 fattening pigs, 100 broilers	15
FS2 Animal-Fish production systems	FS2a: Intensive animal and fish production system	Large scale: 10-30 sao of fishpond, 8-15 sows, 50-100 fattening pigs and 1000-3000 broiler chickens	17
	FS2b: Semi-Intensive animal and fish production system	Medium scale: 5-10 sao of fishpond, 3-5 sows, 30-50 fattening pigs and 500-1000 broiler chickens, 100-300 ducks	21
FS3: Mixed animal-rice production system at small scale		Small scale: 4-6 sao of fishpond, 10-20 fattening pigs, 50- 100 color chickens	22

*Note: * Case study in Cam Giang District, Hai Duong province, Vietnam*

***1 sao= 360 m²*

Source: Bui Quang Dong, 2011

Almost of farm households have crop production and animal production which are the main activities in farm households. In animal production, the pigs and chickens are the most popular but cattle production is not important as pasture limit.

Table 4. Structure of households' income by farming systems

FS	FS1 Vegetable cultivated crops systems				FS2 Animal- Fish production systems				FS3 Mixed animal-rice production system (n=22)	
	FS1a (n=15)		FS1b (n=15)		FS2a (n=17)		FS2b (n=21)			
Source of Income	Q.ty Kd	%	Q.ty Kd	%	Q.ty Kd	%	Q.ty Kd	%	Q.ty Kd	%
Crop prd	151,192	92,8	64,294	35.6	9,405	2.7	12,511	10.7	16,410	13.6
An. prod	0	0	72,566	40.2	216,326	61.2	66,580	56.8	23,560	19.6
Aqua. Prod	0	0	26,986	15.0	92,782	26.2	22,827	19.5	15748	13.1
Off-farm	11,815	7.2	16,600	9.2	34,941	9.9	15,270	13.0	64,685	53.7
Total	163,008	100	180,446	100	353,444	100	117,188	100	120,403	100

Source: Bui Quang Dong, 2011

* 1USD = 20 kd (20,000 VND)

The table 4 shows the proportion of activities' income to household's economy. Besides two main activities are crop production and animal one, there are also other activities being aquaculture and off-farm. These two activities are very popular in countryside with objective of households' income increasing. There is only one farming system (FS1a) that has not animal production and the others always practice animal production. This activity plays an important role in households' economy with its contribution is from 20 to more than 60% of total income.

Challenges of Livestock Production Development in Term of Sustainable Development

- Low productivity

Low productivity in animal production (such as the number of weaned pigs/sow/year in Vietnam is equal to 40-50% compare with developed countries) is one of constraints in livestock production. In the southern east area northern one sow produce annually 1212 kg live weight of fattening pigs, but in the mountainous area, one sow produce only 530 kg live weight. This is about 2800 to 3100 kg/sow/year in Canada and United States (Nguyen Thanh Son et al.,..2016). This is caused by the important population of unimproved sows herd. The locale breed of sow represent about 12%, crossbred sows represent about 70%, the rest are exotic sows (Nguyen Thanh Son et al.,..2016).

- Disease

The epidemiology is the foremost challenge in animal production. Since 2003, many animal farms in nearly all provinces have been facing with the outbreak and repetition of several infectious diseases such as avian influenza, PRRS (Porcine Reproductive & Respiratory Syndrome). In 2007, the PRRS had occurred at 13.355 farm households in 14 provinces, causing a loss of approximate 30.000 heads of pigs. In 2008, the disease had been broken in 28 provinces and the number of culling pigs was 10 times higher than that in 2007 (Binh, Dao et al. 2010). In 2010, the PRRS has broken in 49 provinces and 812,947 heads of

pigs were contaminated and 442,961 pigs have been destroyed (Department of Veterinary, 2010).

FMD (Feet and Mouth Disease) is one of important diseases in Vietnam. In 2010, this disease has been broken in 13 provinces with about 3000 contaminated animal heads. Besides, there are some other diseases that have been occurred such as diarrhea symptoms, Pasteurellosis, which caused an important loss in animal production.

- Strong variation of input and output price

The third challenge is the big fluctuation of animal feed and product price in the market. On average, the price of animal feed in Vietnam is 10% to 20% higher than that in surrounding countries. One of the reasons is the excessive dependence on the imported raw materials for feed formulation. In which, about 45% of energy feed, more than 70% of protein and more than 85% of additives are imported. Thus, farmers have many difficulties in expanding their production scale. On the other side, the price of output products has decreased remarkably (figure 7). In 2017, the extreme falling of both pigs and poultry products caused a big loss for producers. The average price of live fattening pigs in southern market downed from 41,100 dong/kg in November 2016 to 26,000 dong/kg in July 2017, equivalent to a decrease of 63.26% (figure 7). Farmers are now facing extreme challenges from the price fluctuation of both input and output market.

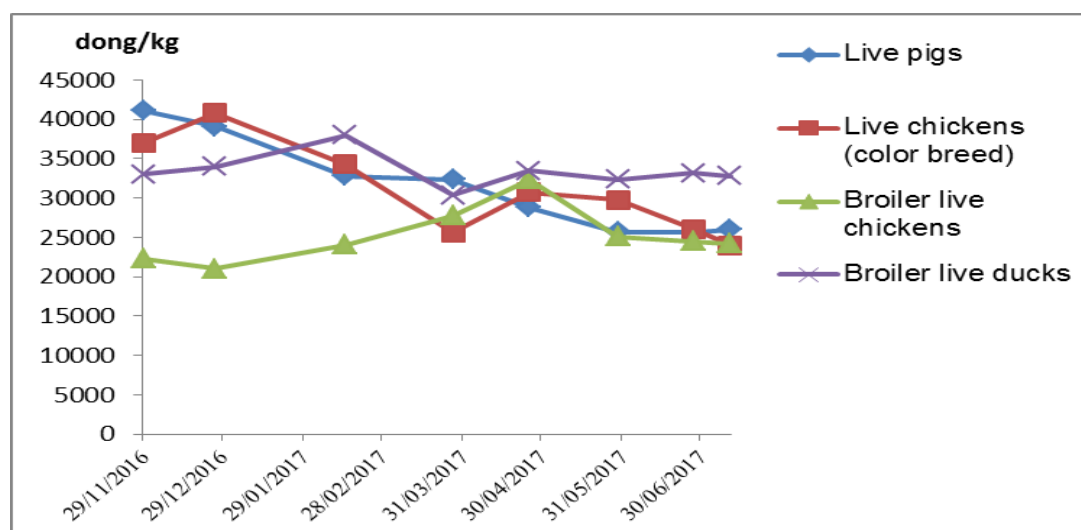


Figure 7. Variation of several livestock products in the Southern market of Vietnam

- Pollution of Environment

The fourth challenge is the threats of environmental pollution from intensive animal production. The expansion of animal herd size produces an extreme amount of wastes (including liquid and solid wastes) that need a comprehensive and effective management and treatment system. However, a high proportion of animal wastes have not been managed and treated well. In estimation, around 40 to 50% of total produced animal waste have been treated before discharging into the surrounding environment.

- Safe products

The food safety is now also an increasing concern of domestic consumers. The overuse of antibiotic and other chemical substances for both purposes of disease prevention and treatment and growth stimulation causes an alarm of food safety. By MARD (2015), there were 7 feed meals that used forbidden substances (Auramine O, Salbutamon, Clenbuterol,...) in order to increasing the lean meat, growth rate, creating better color of the

products and preventing the diseases. According to Department of Veterinary of Ho Chi Minh city (2015), the inspection results at eight slaughterhouse showed that 62.5% of the inspected farms using the forbidden substances with 13.9% of total pork samples detected. Another inspection result stated by Ministry of Agriculture and Rural Development also pointed out that there were 16% of meat samples detected with forbidden substances and 7.6% of meat samples with antibiotic residue.

CONCLUSIONS

Over the last decade, the livestock production sector in Vietnam has changed significantly in to more and more intensive production system. There is a decrease in the number of small-scale farms, while an increase trend in number of medium and large-scale farm holdings. Pig, poultry, and cattle production systems have been all developed at a high rate in order to meet the increasingly requirement of animal origin products of consumers. Animal production always plays an important role in farm households' economy. It is not only an activity in order to poverty decrease but also improve households' economy in countryside.

In the coming years, the livestock production sector in Vietnam has several opportunities and challenges for its development. The increasing demand for food of animal origin products both in domestic and international markets brings an opportunity for the continuous growth of livestock production. However, the livestock production is now facing no ignored difficulties.

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