

## **ENHANCING COORDINATION IN CHICKEN PRODUCTION IN YEN THE DISTRICT, BAC GIANG PROVINCE, VIETNAM**

**Nguyen Thi Duong Nga, Nguyen Thi Thu Ha and Phung Giang Hai<sup>1</sup>**

Faculty of Economics and Rural Development  
Hanoi University of Agriculture, Trau Quy, Gia Lam District, Hanoi, Vietnam  
Corresponding author: ngantd@hua.edu.vn

(Received: June 20, 2011; Accepted: November 3, 2011)

### **ABSTRACT**

Rapid expansion of chicken production in Yen The district, Bac Giang province has promoted the integration among actors in the commodity chain. The study aims to provide a broad picture of coordination activities in chicken production in the district, and to propose recommendations enhancing the integration. Data was collected from 62 chicken farming households which were analyzed using comparative statistics, i.e. test of means, and logit regression to establish the factors that promote the coordination in poultry production among farmers. Despite the large quantity of chicken supply, there is no formal integration among actors in chicken commodity chain in Yen The. Instead, poultry farms have established production groups among themselves– called chicken farming group, with activities based mostly on verbal contracts. Smallholders in chicken farming who joined the groups perceived economic benefits, capacity building, and even spiritual supports among members. Income generated from chicken farming (per kg of liveweight chicken) is higher for farmers in chicken farming group than that of independent holders. Key factors affecting the coordination in chicken production are (i) smallness of the scale of production (related with unreliable supply), (ii) absence of services providers who are willing to coordinate with farmers, (iii) problems during implementation of contracts and (iv) the lack of an enabling environment for coordination. Recommendations for enhancing coordination between farmers and other actors in chicken commodity chain were proposed accordingly, focusing on the strengthen of current CGG and formation of new groups, training for chicken growers, legal supports for coordination in the commodity chain, active involvement of researchers and banks, and improvement of veterinary services.

**Key words:** integration, poultry, producer group

### **INTRODUCTION**

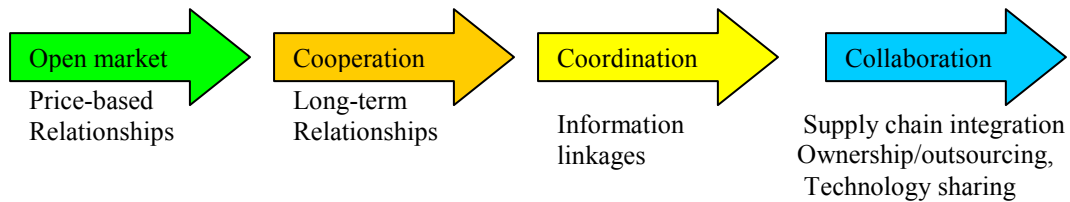
Poultry production is ranked the second largest sector in Vietnam's livestock industry. Although chicken meat is not in the group of commodities bearing serious reduction in import tax due to WTO, domestic chicken producers still face competition from imported broiler and other kind of imported meat, such as pork and beef. A strategy to compete is to supply market with local products which are differentiated from those that are imported. Local chicken is preferred by Vietnamese consumers, especially cockerel, which is considered to be tastier than broiler meat. Therefore, production of local chicken (or indigenous chicken) is a promising strategy for growers to be competitive.

---

<sup>1</sup> PhD Candidate, Faculty of Economics and Rural Development, Hanoi University of Agriculture, Hanoi, Vietnam

Yen The, a district in Bac Giang province, has the potential to produce high quality local chicken, as perceived by domestic consumers. Poultry production has been promoted as one of the key enterprises of the district. In 2008, Yen The was ranked the first district in local chicken production in Northern Vietnam with about 3.5 million bird stock (Yen The Statistics Book, 2009). In the advent of the recent poultry diseases and increasing concerns of consumers about food safety, small and independent poultry smallholders have shown disadvantages in both production and marketing. Thus, integration in chicken industry could be a solution in boosting local production. The study aimed to (i) diagnose the type of integration in local chicken industry in Yen The district; (ii) identify factors influencing the integration of chicken farmers in Yen The district, and (iii) provide recommendations to promote and strengthen the integration of chicken farmers in Yen The district.

Agricultural commodities are exchanged through spot markets or open markets, where there is no obligation between sellers and buyers - this is called simple vertical integration. On the other extreme case is full vertical integration where a firm controls two or more stages in the value chain (FAO, 2009). Between these two extreme cases are other forms of exchange mechanisms like cooperation and coordination (Fig. 1). This study seeks to investigate the case of coordination as a form of integration as applied in poultry production.



Source: Adapted from FAO (2009)

**Fig. 1.** Stages in exchange/business association

There are 3 basic types of integration, namely vertical integration, horizontal integration, and circular integration (Rehber, 2000), of which contract farming is an example of vertical integration. A case study on vertical integration of poultry farms in Orissa, India shows that contract farming between a company (Suguna) with poultry farmers provided higher expected returns compared to independent producers, and even a sense of security among the farmers (FAO (2009)). In another study, Huang (2011) concludes that small family-farming in China is better suited for the new-age agriculture than large-scale mechanized farming, but also requires vertical integration from cultivation to processing to marketing. One of strategies to make smallholders viable, as proposed by Shahoo (2010), is to integrate small farmers with corporate sector by establishing a link between the local and global markets through effective value chain system. The author believes that by forging strategic alliance among farmers, banks, and the corporate sector, a sound business framework can be formulated that will prove to be a panacea for the problems of the agricultural sector, especially among small farmers. Using regression analysis, farmer's participation in contract growing experiences, livestock ownership were found to affect gross margin in wheat farming (Wubalem and Fufa, 2007). On the other hand, educational level, value of agricultural equipment and livestock ownership were important in explaining the participation decisions of the farmers in bread wheat contract farming significantly. Bharat et al. (2006) provides an empirical analysis of contract farming in the case of poultry production in the state of Andhra Pradesh in India.

The results of the study show that contract production is more efficient than noncontract production, and contract growers benefited more in terms of lower risk and higher expected returns than independent farmers. Prabat et al. (2005) examines the integration of the supply chain among small producers of milk, broilers and vegetables in India. Results confirm that contract farming considerably reduced transaction costs and improved market efficiency to benefit the smallholders.

The application of the probit model shows that, in case of broiler, farmer's decision to participate in contract farming depends on his experience in growing chicken. Szabó and Péter (2009) present a successful case of the Hungarian Alföldi Tej Kft (Alföldi Milk Sales and Supply Ltd), a good example of vertical integration in the dairy chain, based on the horizontal coordination of farmers as initiators. Pérez et al. (2005) denotes that horizontal collaboration at farm level is important to facilitate integration or coordination with downstream actors. Coordination to develop commodity supply chain is also the key to increase sector competitiveness. Boger et al. (2001) emphasizes the need to develop an effective supply chain of pork in Canada in the context of increasing competition from other countries. Hobbs et al. (1998) found that even the pork industry in Danish is not cost competitive compared to its rivals in international markets, however, the industry is successful thanks to its organization. In Denmark, four farmer-owned co-operatives account for virtually all pig slaughtering and processing, which is highly technologically advanced. The authors also highlighted the pivotal role of the umbrella organization, Danske Slagterier, in coordinating market research, genetic and meat processing research. Coordination in the supply chain also improves product quality, because uniformity of inputs eases mechanized processing and handling (Martinez, 1999).

## METHODOLOGY

### Sources of data

Yen The is a district of Bac Giang province, covering an area of 30,125.15 ha, of which agricultural land accounts for 30% (Yen The Statistics Book, 2008). The district has 21 communes, with total population of 95,241 and total number of households of 25,136 in 2008.

Secondary data on natural condition and animal production in Yen The district, including herd size and value of production during period 2006-2008, is collected from Yen The Statistics Books. Primary data is collected through a farm survey, using structure questionnaire. Four communes were chosen as study areas, namely Tam Tien, Xuan Luong, Canh Nau, and Tien Thang. Sixty-two chicken growers were interviewed, of which 28 farmers were members of chicken growing group. The questionnaire focuses on general characteristics of farm households, resources for chicken production, relationships between farmers with other actor in the chicken commodity chain, breeds, cost and return of chicken production, and other arrangements of growers in production and marketing.

### Analytical tools

Descriptive statistics were computed and subjected to the test of means (t-test) for statistical comparison. Assuming  $X_1$ ,  $X_2$  are independent and random variables from two populations with means of  $\mu_1$  and  $\mu_2$ , respectively. The hypothesis on the equality of the two means ( $H_0: \mu_1 = \mu_2$  vs.  $H_1: \mu_1 \neq \mu_2$ ) can be tested using t- statistics, calculated as followed (Gravetter and Wallnau, 2000):

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{x_1 - x_2}} \sim t_{n_1-1, n_2-1}$$

Where  $n_1$ ,  $n_2$  are sample size of  $X_1$  and  $X_2$ , respectively.

$$S_{x_1 - x_2} = \sqrt{\left( \frac{S_p^2}{n_1} + \frac{S_p^2}{n_2} \right)} \text{ where } S_p^2 = \frac{SS_1 + SS_2}{n_1 + n_2 - 2}$$

$$SS_1 = \sum X_1^2 + \frac{(\sum X_1)^2}{n} \text{ and } SS_2 = \sum X_2^2 + \frac{(\sum X_2)^2}{n}$$

Also, the logit model was used to identify the factors affecting farmer's decision to participate in the chicken growing groups. Y is a dichotomous variable, which takes value of 1 if the farmer has membership in chicken growing group and zero otherwise. The model is specified as follows:

$$\ln[P_i/(1 - P_i)] = \alpha_0 + \alpha_1.X_1 + \alpha_2.X_2 + \alpha_3.X_3 + \alpha_4.X_4 + \alpha_5.X_5 + \epsilon_i$$

$P_i$ : probability that  $Y_i = 1$ , and  $(1 - P_i)$  is probability that  $Y_i = 0$ .

Independent variables are defined as follows:

- $X_1$ : Number of chicken bird per cycle (1000 bird)
- $X_2$ : Gender of farm household head, = 1 if Male, = 0 otherwise
- $X_3$ : Years of schooling of household head (years)
- $X_4$ : Age of household head (years)
- $X_5$ : Experience in growing chicken of household head (years)

Logit model was run by LIMDEP version 7.0, developed by William Green.

## RESULTS AND DISCUSSION

### Coordination in chicken production in Yen The

The People Committee of Yen The district has approved the program “Development of Agriculture and Forestry for the period 2006-2010”, of which chicken production is considered as a key enterprise. Most of the communes, especially those covering large area of grazing land, were targeted for the development of this sector, such as Canh Nau, Tam Tien, Xuan Luong, Dong Vuong, and Tien Thang. According to the district statistics, poultry production in this sector grew at rate of higher than 50% during period 2006-2008, and contributed about 43 % in total output value of animal production in 2008, of which chicken production dominates (Table 1).

**Table 1.** Output value of animal production in Yen The, period 2006-2008 (mil. VND).

Sub sector	2006	2007	2008
1. Cattle	67,112	84,601	102,113
2. Poultry	27,972	48,560	78,522
- Chicken	26,573	47,040	76,709
- Other poultry	1,399	1,520	1,813
3. Others	2,666	2,872	3,259
Total	97,750	136,033	183,894

Source: Yen The Statistics Book, 2009

Rapid growth of chicken production partly accrues to programs implemented by local government. In 2007, a program focused on chicken breeding was developed, and in 2008 a program on sustainable development of chicken production was implemented. During period 2006-2008, total chicken birds grew at rate of 23%, fattened chicken grew by 24%, where 28% consists of hens (Yen The Statistics Book, 2009). According to the Yen The Department of Agriculture, there were about 19,000 chicken growers in the district in 2008 (accounting for about 75% of total number of households). Production of chicken was about 3.4 millions, supplying more than 7,000 tons of chicken meat and 4 millions eggs for the local market.

Up to the time of survey, there were more than 15 firms who provided concentrated feeds for chicken growers in Yen The district; however, no firms had contract farming with farmers individually. These firms also did not buy products from growers, but willing to provide feeds for farmers on credit, through level-2 feed agent. Feed companies in Vietnam normally distributed products through feed agents, level 1 and level 2. The former buys feeds directly from company, where the later get feeds from the former. Also, there were no processing companies nor food

companies who buy chicken from the farmers on contract. As scale of production increases (many growers produced 3000-5000 birds/cycle), farmer's concern grew on how to market their products. Farmers in some communes have organized themselves into groups – called chicken growing group (CGG). Each group has 7 -15 members who normally reside in the same commune, two group leaders were nominated by members. Membership fee was 2 million VND (about 100 US\$) for the participation. Group activities focus on input procurement, output marketing, and exchange of experiences and information. Members buy inputs (mostly feeds and chicks) collectively from a common provider. Group leaders are responsible for arranging activities in buying inputs, dealing with providers to buy feeds and chicks in large quantity at a discounted price. These group buy concentrated feeds directly from the feed agents level 1, hence enjoy lower price. To help member to market products, group leaders deal with private traders (local and from other provinces) who market chicken for members in large quantities. Besides, group members meet at least once a month to exchange information on market, technological information, as well as experiences in growing chicken, or meet to discuss about problems of members to find possible solutions. CGG does not require all members to buy inputs and sell outputs to the same agent. However, once a member joins the group, he has to make commitments with group leaders, and abide by the rules of the group.

Other farmers who are not members of the CGG mostly operate individually; some of them also establish regular contact with input provider (level-2 feed agents) and private traders. However, due to small quantity of transaction, these relationships (often through verbal arrangement) are normally loose, which could be easily broken. These farmers are called independent growers in this study.

### **Characteristics of respondents**

Family size of surveyed farm households is 4.3 persons for CGG members and 4.5 for the independent farmers, and there is no significant difference between the two groups. However, farmers in CGG, generally, have better education than the independent farmers, with average years of schooling of about 10 years (Table 2). Farmers in CGG also have more experiences (5 years) in growing chicken compared to only 4 years for independent farmers. Interestingly, grazing land area, which can be used for chicken production, is larger for independent farmers (0.33 ha) than those in CGG (0.21ha). This implies that the former group does not use up all grazing land for chicken. Farmers in CGG produced about 4 chicken cycles per year, significantly higher than the independent ones which were only 3 cycles per year (Table 2). On the average, chicken production contributed nearly 90% in total farm income in 2008.

**Table 2.** General characteristics of surveyed farm households.

<b>Description</b>	<b>CGG (1)</b>	<b>Independent farmers (2)</b>	<b>Difference (1-2)</b>
Age of household head (year)	37.95	39.65	-1.7 <sup>NS</sup>
Years of education (year)	10.19	8.47	1.72 <sup>**</sup>
Experience in growing chicken (year)	4.90	3.85	1.05 <sup>**</sup>
Family size (person)	4.3	4.5	-0.2 <sup>NS</sup>
Grazing land (m <sup>2</sup> )	2,145	3,309	-1,164 <sup>***</sup>
Number of chicken cycle year <sup>-1</sup>	4.05	3.26	0.79 <sup>*</sup>
Number of bird cycle <sup>-1</sup>	965	620	345 <sup>***</sup>
Contribution of chicken production in total income (%)	87.77	85.74	-

Source: Calculated from survey, 2009

Note: \*\*\*, \*\*, \*: significant at 1%, 5%, and 10%, respectively. NS: non-significant

### **Coordination activities**

**Coordinating with chicks providers.** Chicken breeds used by growers in Yen The district are local chicken, and cross-breed between local chicken and other Chinese breeds, such as Luong Phuong and Tam Hoang. The former breed is deemed better in quality than the later in terms of taste, firmness of meat, and other cooking qualities. CGG normally maintained relationships with several chicks providers, and choose the best one based on quality, quantity, and price. However, the transaction was done mostly on verbal contract, except in case of farmers growing cross-breed chicken, where written contract was signed with Thuy Phuong poultry breeding center (belong to the Ministry of Agriculture and Rural Development - MARD). About 86% of the farmers in CGG bought chicks from permanent providers (Table 3), while most of the independent farmers sourced their inputs freely from open market or produced chicks themselves. Only a small proportion of the independent farmers (18%) built relationships with permanent providers, but these relationships were loose, hence the farmers can switch among providers anytime. While chick providers for CGG included large hatcheries and breeding stations (both private and government owned), independent farmers bought chicks from various sources, including traders who collected chicks and eggs from many places. Note that this is one of reasons behind the rapid spread of chicken diseases among districts and provinces. Through bulk buying, farmers in CGG enjoy both lower price and more homogeneous chick quality than independent farmers.

**Table 3.** Coordination between chicken growers and permanent input and services providers.

Input/services	CGG		Independent farmer	
	No. of farmers	As percentage in CGG	No. of farmers	As percentage of total
1. Chicks	24	85.71	6	17.64
2. Feeds	28	100.00	27	79.41
3. Medicine and veterinary services	19	67.86	6	17.64
4. Credit	20	71.43	15	44.11

Source: Calculated from survey, 2009

**Coordinating with feed providers.** All members in CGG bought concentrated feeds from the same suppliers. Similarly, bulk buying affords the members lower price and more consistent quality feeds. Direct suppliers of CGG are feed agent level 1, thereby the group becomes as a feed agent level 2 which can offer discounted feed prices to the members (up to 4% lower prices). However, the group is not allowed to buy on credit – which is allowed if buying from feed agent level 2. Transactions were made through verbal contract between CGG and suppliers. Therefore, when the group encounters bad quality feeds, they simply switched to other supplier in the next cycle without admonition nor compensation from the erring supplier due lack of formal contracts. On the other hand, 41% of the independent farmers had also established relationships with feed suppliers through feed agent level 2. At present, exchange between independent farmers and feed suppliers is simply price-based.

All the CGG members bought other feeds, such as maize and rice bran, from permanent traders, while 18% of independent farmers maintained this type of relationship. This is the reason why some of the independent farmers had to buy rough feeds with higher prices, or could not buy enough quantity at time of shortage supply in the market. Verbal contract was the way of coordination between CGG and traders, and there were very few breaks of arrangements between them as reported.

**Coordinating with medicine and veterinary services.** Poultry disease and avian influenza are highly important concerns of growers because of higher frequency of incidence and heavy losses. In the

system of government veterinary services, there is a veterinary station in the district and a veterinary staff in each of the 21 communes. Even there are more than 19,000 chicken farmers in the district, there is no professional veterinary doctor who could provide services to farmers in many communes. Therefore, most of farmers seek advices from veterinary medicine providers, who usually give prescription based on farmer's description about symptoms of animals. About 68% of the farmers in CGG chose permanent veterinary services providers (mostly agents), while some independent farmers (about 18%) had permanent contact with the services providers (including both government veterinary station and medicine suppliers). However, the qualities of medicines and veterinary services were below par, as reported by 81% of farmers. Because of the lack of contract between farmers and services suppliers, 100% of the damage during disease infestation was burdened by the farmers. This is one of the main reasons why long term relationship between these actors could not be established in the poultry sector.

**Coordinating with credit supplier.** The Vietnamese Bank of Agriculture and Rural Development (VBARD) is the biggest credit supplier for farmers. The bank offers better interest rates than informal credit supplier, but demands also for collateral and timely payback. Nearly 71% of farmers in CGG maintains relationships with the bank, and only 44% of independent farmers borrows from the bank (Table 3). However, complicated procedures and short-term loans (with 6 months duration) are the main constraints to farmers to access bank credit, as reported by 65% of farmers. Short-term loans are often not sufficient to cover the time period needed for the borrowers.

Both independent farmers and those in CGG had recognized benefits from relationships with permanent suppliers. Benefit from buying feeds, on credit was reported by about 88% of independent farmers (Table 4), while no famers in CGG perceived this, as CGG bought feed from the feed agent level 1. However, most of farmers in CGG (95%) were able to buy inputs with lower prices and did not have to pay for transportation cost. Input suppliers also provided information on potential markets to farmers, especially feed and chick suppliers, as reported by 57% of farmers in CGG and 14% among independent farmers.

**Table 4.** Benefits from relationship with permanent input suppliers, as perceived by farmers.

<b>Benefits</b>	<b>CGG</b>	<b>Independent farmers</b>
Free transportation cost of inputs to farm	85.71	28.57
Buy inputs on credit	0.00	85.70
Technical assistance	73.08	53.57
Lower prices	95.00	28.57
Better input quality	65.00	57.14
Better output quality	60.71	58.82
Provided information on potential markets	57.14	14.29

Source: Calculated from survey, 2009

Having permanent contact with input and services suppliers, farmers were provided advices and technical assistances on feedlots, prevention and treatment of chicken diseases, as reported by 73% of farmers in CGG and 54% of independent farmers (Table 4). This is translated into farmer's actions in caring and preventing diseases for their animals. According to the survey, more than eighty percent of farmers in CGG frequently attended trainings on chicken health care, while less than one-third of independent farmers did so. Farmers in CGG had also complied more to proper procedures in chicken rearing, i.e. appropriate design of chicken barn, investment in facility, feedlots, and others measures to prevent diseases. While 100% of farmers in CGG did vaccination to prevent chicken influenza and other diseases, only 80% of the independent farmers practice vaccination. Almost all farmers in CGG cleaned their chicken barn periodically, being aware that proper protection of grazing

land with fences will prevent chicken from disease infection. Meanwhile, less than 40% of independent farmers cleaned chicken barn periodically. In 2008, about three-fourths of independent farms experienced serious diseases infestation, which caused a morality rate of about 5% in about half of the farm.

**Coordinating with marketing agents.** Dressed chicken could not be stored or processed at the farm, therefore, timely marketing of the product is very important to growers, especially those operating in larger scale. All respondents expressed their interest to have regular buyers, and had tried to establish long term relationships with trading agents. Helping members to market their product is a main purpose of CGG, however, not all farmers in CGG was able to sell products to regular buyers due the following reasons (i) the group was not able to find marketing agents who are willing to buy products of all members at the same time, (ii) some members can not satisfy buyer's quality and quantity requirements, and (iii) several members break the agreements between CGG and buyers. To date, there is no firm nor food/processing companies who buys chicken directly from farmers, only private traders and assemblers. While 75% of farmers in CGG sell products to permanent traders (Table 5), only 18% of independent farmers can do so.

**Table 5.** Regular buyers of chicken growers in Yen The district.

Regular buyers	CGG		Independent farmers	
	No. of farmers	As percentage in CGG	No. of farmers	As percentage of total
Local trader	8	28.57	2	5.88
Trader from other district/provinces	7	25.00	4	11.76
Assembler	6	21.43	0	0.00
Total	21	75.00	6	17.64

Source: Calculated from survey, 2009

Though verbal contract is the only way of implementing coordination between CGG and traders, farmers in the groups were able to exercise collective action when dealing with buyers. Given the advantages over independent farmers in terms of more reliable supply and consistent quality (resulting from using from same source of chicks, feeds, and better health care for chicken), CGG was able to negotiate for a better price. On average, price of chicken was about 1% higher for local chicken and 2% higher for cross-breed chicken, as sold by CGG compared with independent farmers. Moreover, members in CGG reported that they felt more confident and had less worry about marketing their products, thus enabling them to focus on improving quality of product to maintain relationships with traders. But CGG had also experienced the breakdown of verbal contract by traders, hence members had to collect their products and transport them to other markets.

Majority of independent farmers deal with as many traders as they can and sell products to anyone offering the highest price. In turn, traders could set low prices, especially at times when there is disease outbreak or excess supply in market. Without proper understanding of the market situation, these farmers had no choice but to sell their products at the prices offered by the traders which are normally low.

### **Cost and return analysis**

There is significant difference in total cost and gross income of CGG members and independent farmers. On average, cost of 1 kg of live weight local chicken produced by CGG member was 3.42 thousand VND lower than that of independent farmers (Table 6). The difference comes from several sources, namely (i) lower input price and higher output price for farmers in CGG ,



and (ii) higher mortality rate for independent group and higher veterinary cost. On average, income from 1kg of live weight local chicken is 22.79 thousand VND, significantly higher than that of independent farmers (Table 6).

**Table 6.** Cost and return from chicken production (1000VND per kg live weight chicken).

	CGG	Independent farmers	Difference
1. Local chicken			
Price	51.68	51.15	-
Cost	28.14	31.56	-3.42*
Income	23.54	19.59	+3.95***
2. Cross-breed chicken			
Price	43.44	42.55	-
Cost	21.55	23.02	-1.47***
Income	22.79	19.53	+ 3.27***

Source: Calculated from survey, 2009

Note: \*\*\*, \*\*, \*: significant at 1%, 5%, and 10%, respectively. NS: non-significant

### **Factors affecting the coordination**

*Unreliable supply is a constraint for sustainable coordination with traders.* Once a verbal contract is made with farmers, traders arrange with other actors in the supply chain and prepare for the shipment, such as transport vehicle and payment. If actual quantity of trade is lower than planned, traders incur more cost per unit of product which breaks the arrangements with other downstream buyers as well. This happens mostly to farmers who do not have good experiences in rearing chicken, i.e. unhygienic barn, poor chick quality, and improper health care for chicken.

*Small scale of production.* Traders prefer to buy from fewer producers for more consistent quality and to save on transaction cost. More than half of independent farmers produce from 500-700 birds/cycle, which is not attractive to big traders who buy several tons at a time. Since farmers with small quantity are more flexible in switching among buyers, this makes traders hesitate to integrate with them. CGG can provide a solution to this problem, but member's fee is perceived to be quite high, according to independent farmers. Also, even if CGG could buy inputs at lower prices, the need to pay in cash proved to be a deterrent to independent farmers, especially those who have insufficient capital.

*Absence of integrators as marketing agents.* Up to the time of survey, feed and veterinary medicine companies and agents exist in Yen The just to sell products. No food or processing companies buy chicken directly from farmers. Even when the Vietnamese government has issued the Decree 80/2002/QĐ-TTg, which stresses on encouraging the marketing of product through contract with farmers, there were still no respondents who knew about this decree. Therefore, despite the large quantity and good quality of chicken that are produced in the district, farmers were still not able to reach the final consumers through the main distributors. Hence, the brand name "Yen The chicken" finds difficulty in breaking through the market.

*Problems in coordination.* There have been always cases where agreements between farmers and other actors were not properly complied with. CGG experienced poor feed quality with suppliers due to lack of information and no written contracts that define the rights and responsibility of contractors. When CGG was just starting in Tam Tien commune, low quality feeds from a local producer were procured but no compensation nor reprimand were imposed to admonish the feed dealer. Similarly, there were four chick suppliers for CGG that sold poor quality chicks. CGG had to stop contract with these suppliers due to degraded quality of chicken producer with any redress from the chick suppliers.

The difference between agreed output price and prevailing market price always caused both farmers and buyers to diverge from agreements. Sometimes prices were re-negotiated before deals can be made. If the deal was not successful, CGG had to transport chicken to sell in other provinces. There are also cases when farmers break the agreements by selling products to other trader for higher prices. Besides, long-term relationship between CGG and several big traders is often broken when the group did not satisfy requirements on quantity and time of delivery. In general, marketing of products depends largely on private traders and assemblers through verbal agreements, where risks falling heavily on farmers.

*Policies and other issues in enabling environment.* Problems between farmers and other integrators were solved mostly by the actors themselves, without facilitation (legal and enforcement) from local government. Hence, farmers with little or no power in negotiation are always at the losing end. This had happened with CGG in Tam Tien commune when they first signed a contract with local feed producer. Since the formation of CGG is largely voluntary, there was no legal recognition to carry out activities for members' benefit, such as access to cheaper credit, or expand relationship with government agencies in agriculture and rural development.

Farmers, especially those under large scale operation, are willing to pay for good veterinary services. However, with only one veterinary staff in each commune and the absence of professional veterinary doctor, farmers either prescribed medicines for their chicken by themselves, or asked dealers of veterinary medicines. Since movements of chicks, chicken and eggs among provinces are not strictly controlled, farmers are therefore constantly exposed to risks. In addition, since chicken are raised in open areas with the absence of good veterinary services in the district, the industry is highly vulnerable to disease infestation. The problem became more serious as the spread of the disease grew faster and more unpredictable. Quality of chicks is also a big concern. There were when cases hatcheries provided good chicks for first few transactions, and then the chick quality deteriorated overtime. In addition, degraded infrastructure is also a concern of both farmers and traders, as it translates into higher marketing cost, especially during rainy season.

### **Factors affecting CGG membership**

Logit analysis was conducted to determine the factors affecting farmer's decision to participate in CGG. McFadden's Pseudo R<sup>2</sup> – a measure of goodness of fit in the model – is 0.39, and the model is statistically at 1%. The results show that scale of production has significantly influenced on farmer's decision, i.e., if total number of chicken raised increases by 1000 birds, the probability to join CGG increases by 0.386 (Table 7). Years of schooling and experiences in chicken farming also have significant positive impact on the farmers' decision. Gender and age of household heads are shown to have no significant impact on their decision.

**Table 7.** Results of logit model regression.

<b>Variables</b>	<b>Coefficient</b>	<b>P - Value</b>	<b>Marginal effect</b>
Constant	-11.79	0.01	-
Number of chicken bird per cycle	1.65**	0.03	0.386**
Gender of farm household head	-0.22 <sup>NS</sup>	0.80	-0.510 <sup>NS</sup>
Years of schooling of household head	0.68**	0.03	0.160**
Age of household head	0.03 <sup>NS</sup>	0.70	0.634 <sup>NS</sup>
Experience in growing chicken of household head	0.68*	0.06	0.158*
Chi – squared	33.57***	0.00	-
McFadden's Pseudo R <sup>2</sup>	0.393		
n	62		

Note: \*\*\*, \*\*, \*: significant at 1%, 5%, and 10%, respectively. NS: non-significant

### **Recommendations to enhance coordination in chicken production in Yen The district**

The above analyses show that coordination brings benefits for farmers, even if the coordination among farmers is just at level of self-help group. In the future, to compete with imported meats (and chicken), as well as with local chicken from other provinces, the chicken commodity chain in Yen The needs to be developed, where vertical integration between farmers and integrators must be established and strengthened, to provide final consumers with the acclaimed quality of the “Yen The chicken”.

The following recommendations are proposed to promote coordination in the poultry industry in Yen The districts:

- a. Formation of new CGG should be encouraged and capacity of current CGG should be strengthened.* At present, despite the lack of firms who are willing to sign contract with farmers, CGG is still a good solution. However, capacity of CGG must be strengthened in terms of number of members, consistency in the quality of output, and reliable supply, in order to meet the requirement of big traders. CGG should contact directly to feed companies for better price and enjoy other benefits of being as feed agent level 1. CGG also should look for food companies or distributors in big markets, such as Ha Noi, Hai Phong, and Quang Ninh. In order to do so, CGG leaders (and big farmer members as well) should be trained for communication and negotiation skills, and contract developments. CGG should also include other actors in the chain, such as chick and feed suppliers, veterinary services providers, and traders in order to integrate effectively within the group. Also, screening of members is a must to ensure the reputation of the group.
- b. Chicken growers should be equipped with more technical skills in production and marketing of products.* Extension services provider should focus more on training the farmers about biologically safe chicken production, from barn construction, feedlots, health care, and proper harvesting procedures. This is to help farmers to have better quality and more reliable supply of products. Farmers also should learn to comply with arrangements set with integrators to build trust and maintain long-term relationship.
- c. Legal supports for coordination in chicken commodity chain are needed.* Contract farming will be the way of integration between farmers and integrators. Local government plays an important role in certifying the legality of contracts, as well as in providing enforcements for contract implementation. In the mean time, while CGG has no legal recognition and mostly weak in negotiation, the local government in providing legal support to CGG. This support is in line with the promotion of public-private partnership in development of the sector.
- d. Researchers and banks can also be tapped to promote coordination.* There should be a close link between researchers and farmers in order to update information about chicken health status and other problems in the industry. New technologies and good farming practices can also be disseminated through these linkages. Farmers in CGG have expressed their desire to have researchers involved in their group meeting every month. This will strengthen the capacity of both farmers and researchers, as well as public-private relationship. Assistance from the Vietnamese Academy of Agricultural Science, Hanoi University of Agriculture, and other colleges should also be solicited. In addition, VBARD should consider to increase the amount of loans and loan duration (preferably more than 6 months) for the farmers.
- e. Veterinary services should be improved.* Both public and private veterinary services need to be strengthened to meet farmer’s need. Local government encourages private veterinary services but must be strictly regulated to ensure quality services delivered to farmers.

Government veterinary staff should also have close contact with researchers in universities and research institutes to continuously improve their knowledge and skills.

- f. Local government should create favorable conditions to attract firms to invest on poultry sector in the district.* The improvement of roads, easier access to land use right, tax incentives, among others can attract firms to be involved in the sector development. Participation of food processing companies and distributors are the key to the integration process. Therefore, when the involvement of the private sector is not strong enough to do contract farming with chicken growers, the state enterprises should take the initiatives to boost the coordination in the sector, or public-private partnership in this area.

## **CONCLUSIONS**

Local chicken production in Yen The district is largely based on a large number of small farmers. As the sector develops, there emerged a kind of integration among farmers to form groups, called chicken growing group (CGG). The main characteristics of these groups are (i) voluntarily established with no legal recognition; (ii) members are not necessarily required to buy inputs or sell outputs to the same integrators; and (iii) coordination is based on verbal contract. Up to the time of survey, there was only one CCG and several groups in the process of continuing formation with limited members. CGG established relationships with integrators to help member buy inputs with lower price, and sell products at higher prices. Farmers in CGG perceived economic benefits, capacity enhancement, and spiritual encouragement among members. Analysis of cost and return shows that gross return per kg of live weight chicken is higher for farmers in CGG.

Coordination failure in chicken production in Yen The is influenced by a number of factors, namely farmer's unreliable supply, small scale of production, absence of integrators who are willing to do contract farming with growers, breaking of agreements between farmers and other actors, and lack of enabling environment. The logit analysis confirms that scale of production, education level of household head, and farmers' experience in rearing chicken positively influence their decision to participate in CGG.

Several recommendations were forwarded to develop the integration of chicken farmers with integrators. In the short-term, priority is given to existing CGGs, focusing on strengthening the capacity of the groups in terms of membership and production. Similarly, increasing the leaders' capability in communication, negotiation and contract development is highly desirable. Government is seen to play an important role as facilitator in forming alliances between farmers with other actors, such as banks, researchers, and firms, thus encouraging public-private partnerships, and in framing suitable policy for the development of the sector. As long as the private sector is not ready to enter into contract farming with chicken growers, the government should involve state marketing agencies and/or enterprises to fill in the gap.

## **ACKNOWLEDGEMENT**

The study was financially supported by the Faculty of Economics and Rural Development, Hanoi University of Agriculture, Vietnam, under the annual fund for lecturers and graduate students to conduct scientific research.

## **REFERENCES**

- Bharat Ramswami, Pratap Singh Birthal, and P.K Joshi. 2006. Efficiency and distribution in contract farming: The case of Indian Poultry Growers. MTID discussion paper No.91. International

Food Policy Research Institute. 50pages. Available at <http://ideas.repec.org/p/fpr/mtiddp/91.html>, retrieved January 2011.

- Boger, S., Hobbs, J.E. and W.A. Kerr. 2001. Supply chain relationships in the Polish pork sector. *Supply Chain Management: An International Journal*, 6(2)74.
- FAO [Food and Agriculture Organization]. 2009. Vertical Integration at Suguna Poultry Farms - A Critical look at Pro Poor Livelihood Issues. Available at <http://www.sapplpp.org>, retrieved January 2011.
- Gravetter, F. J. and L. B. Wallnau. 2000. *Statistics for the Behavioral Sciences*. Wadsworth publisher, Fifth edition. 726p.
- Hobbs, J.E., Kerr, W.A. and K.K. Klein, 1998. Creating international competitiveness through supply chain management: Danish pork. *Supply Chain Management*, 3(2)68.
- Huang, Phillips C. C. 2011. China's new-age small farms and their vertical integration: Agribusiness or Co-ops? *Modern China*. February 9, 2011 37(2) p.107.
- Martinez, S. 1999. Vertical Coordination in the Pork and Broiler Industries: Implications for Pork and Chicken Products (AER777). Economic Research Service, United States Department of Agriculture: Washington, DC. 43 pages.
- Rehber, E. 2000. Vertical coordination in the agro-food industry and contract farming: A comparative study of turkey and the USA, Food Marketing Policy Center, Connecticut, USA, Research Report No. 52. 45 pages.
- Szabó, Gábor G. and Péter Popovics. 2009. Possible ways of market coordination and integration in the Hungarian dairy sector. *Journal of Rural Cooperation*, 37(1):32-51.
- Shahoo, B.B. 2010. Global market and local players: A value chain system of collaborative strategies. *Agricultural Economics Research Review*. 23 : 535-543.
- Prabat S Birthhal, P.K. Joshi and Ashok Gulati. 2005. Vertical coordination in high-value food commodities: Implications for smallholders. MTID Discussion paper No.85. 63 pages.
- Pérez C., De Castro R. and D. Simons. 2005. Pork supply chain: a review. In Proc, 10<sup>th</sup> International Symposium on Logistics, Lisbon.
- Wubalem, G and B. Fufa. 2007. Integrating small scale farmers into bread wheat marketing chain through contract farming in Ethiopia, pp 239-242. In Proc. 50<sup>th</sup> AAAE Conference, Ghana.
- Yen The Statistics Book. 2008. Computation and Statistic Template Report Publishing Center, Bac Giang Statistics Department.
- Yen The Statistics Book. 2009. Computation and Statistic Template Report Publishing Center, Bac Giang Statistics Department.