Tropentag 2007
University of Kassel-Witzenhausen and
University of Göttingen, October 9-11, 2007
Conference on International Agricultural Research for Development

Production and Marketing of Indigenous Pig Breeds in the Uplands of Vietnam

Thi Mai Huong Pham[a], Marcus Mergenthaler[a], Brigitte Kaufmann[b], and Anne Valle-Zárate[b]

a University of Hohenheim, Institute for Agricultural Economics and Social Sciences in the Tropics and Subtropics (490b), 70593 Stuttgart, Germany, Email: huongmaipham@yahoo.com

b University of Hohenheim, Institute of Animal Production in the Tropics and Subtropics (480a), 70593 Stuttgart, Germany

Abstract

On the background of the marginalization of small pig producers in the highlands of Northern Vietnam, this study analyses the economic impacts of indigenous pig breeds and trading relations at the household level. Data was collected from 70 households keeping Mong Cai and indigenous Ban sows in Son La province. Also data from downstream actors in the supply chain was collected. Despite, higher net marketing margins per kg for Ban pigs than for LWxMC pigs, Ban pigs achieve higher farm gate prices – particularly when farmers have a preferred buyer. The impacts of indigenous pig breeds and trading relations on gross margins and household income are estimated in multiple linear regression models. The results show that while keeping of indigenous Ban pigs by farmers who have long-term trading relations has positive effects on the economics of pig production, only keeping Mong Cai pigs of farmers with trading partners increases per capita household income.

Keywords: indigenous pig breeds, Ban pigs, economics of pig production, trading relations, marketing efficiency

Introduction

In Vietnam there is a growing demand for indigenous pigs as specialty food driven by consumers' preference in urban centers. The majority of indigenous pigs, however, has currently decreased. In order to meet increasing demand, policy efforts have been dedicated to develop the national pork market in Vietnam (Lapar et al., 2003). As the focus has been mainly on the lowlands, pig production in the uplands, which is small scale and relies on available natural resources, seems to be marginalized. In conjunction with this, many types of indigenous pig breeds – traditionally raised in small scale production units in the uplands – have been at risk of extinction (NIAH, 2003). In Son La province this situation is exemplified with Ban pigs: In closer proximity to major towns, Mong Cai (MC) have been introduced and have often replaced the Ban pig. In remote villages, Ban pigs are still kept, although their status regarding extinction is “vulnerable”.

Markets for indigenous pigs in the mountainous areas are assumed to be highly segmented. Producers sell mainly in nearby neighboring markets and are hardly linked to more lucrative urban markets. This is believed to lead to low prices for farmers. In addition, distribution of

marketing margins is often not equitable among actors. This might be attributed to a lack of integration among actors in the marketing channels.

Although not formalized yet, specialized supply chains for local pigs are currently emerging (Cuong, 2004). These supply chains employ distinct institutional arrangements among actors, i.e. farmers have a preferred buyer to whom they built up a long-term relationship. These long-term relationships bear benefits to both trading partners, as they reduce transaction costs. If the emerging supply chains prove to be sufficiently competitive, they provide a viable venue for an *in situ* conservation of the Ban breed and at the same time can contribute to improve household incomes for people living in the uplands area.

Therefore the specific objectives of this study are:

(1) to study the marketing channels for Ban pigs and quantify net marketing margins of supply chain actors,

(2) to analyze production economics of Ban, and

(3) to identify the role of Ban pigs and trading relations to overall pig production and household incomes

Material and methods

Data were obtained from 70 randomly selected local producers in three Thai villages in Son La province in a survey between March and May 2007 (for characteristics of the study location see Table 1). In addition PRA was conducted to obtain background information.

Table 1: Overview of selected villages in study location

Village	Ot Luong	Noong La	Buon
District	Son La town	Son La town	Son La town
Market proximity	Far	Medium	Close
Predominant sow breeds	Ban	Ban	MC
Predominant fatteners	Pure Ban and offspring	Pure Ban and offspring	LWxMC
Production system	Resource-driven	Resource-driven	Demand-driven
No. of selected households	30	20	20

Notes: LW = Large White pig breed

Farmers were surveyed to collect information about economics of pig production and marketing characteristics. In addition data related to general household characteristics were asked for. Based on the marketing information from farmers, actors in each supply chain were traced. Downstream supply chain actors were interviewed in order to quantify the net marketing margins and to identify final markets of the products. Interviews were conducted with the help of a standardized questionnaire.

Results and discussions

Marketing channels

Regarding the marketing of pigs, two types of arrangements can be distinguished: There are farmers selling to changing buyers. On the other side, there are farmers who have a preferred buyer to whom they have a firmly established trading relation. Long-term trading relations give traders the incentives not to exploit asymmetric information, which would force farmers to sell at lower prices compared to a more transparent market. Besides of the advantage of receiving higher prices, households cooperate with trading partners because it brings them other advantages such as an ensured outlet, on time payment, exact scale, and a reliable information source. Most of pig

keepers indicated that their trading partners are normally honest and keep promise. Some pig keepers reported of collusive behavior of traders during times the supply of pigs increased in the market.

Marketing margins

The net marketing margin is an indicator of the efficiency of a market. It is calculated as the difference between the price at one level or state in the market less marketing costs and the price at another level (ILRI, 1995). The smaller the net marketing margin the greater the efficiency in the marketing system and vice versa. Traders of Ban pigs achieve higher net marketing margins per kg than LWxMC pig traders (Table 2). The share of producers' price in retail price of LWxMC pigs is higher than that of Ban pigs. Compared to a study by Cuong (2002) and Lapar et al. (2003) this share is lower than that in the lowlands, where 85-90% of the retail prices are captured by farmers. This is an indication of less integrated markets in the uplands. Moreover, marketing margin ranged from 42% of the farm gate price for LWxMC pigs to 52% for Ban pigs. This meant that farmers producing Ban pigs got a less remunerative price for their pigs than those producing LWxMC due to higher marketing cost.

Table 2: Net marketing margins among actors in the supply chain, 2006

	Producers	Collectors	Traders	Retailers
Net marketing margin (Ban)		400	1,972	2,150
Share in 1000 VND (%) (Ban)	65	5	14	16
Net marketing margin (LWxMC)		na	1,529	1,750
Share in 1000 VND (%) (LWxMC)	71		15	14

Notes: na = no answers

Production economics

The analysis of production economics shows that Ban production yields higher gross margins and higher average net benefit ratios than LWxMC production – if trading relations are accounted for (Table 3). The average net benefit ratio is significantly higher for Ban keeping households compared to their MC keeping counterparts. Comparing households keeping the same pig genotype, households with trading relations achieve a higher economic efficiency than those without trading relations.

Table 3: Efficiency of pig production at selected households, with and without trading relations (VND 1,000)

	Ban pig keepers		MC pig keepers	
	No trading relations	Have trading relation	No trading relations	Have trading relation
Households (n)	32	18	7	13
Gross revenue fattener^{-1} (GR)	893 ± 156	995 ±140	973 ±149	1015 ± 131
Variable costs fattener^{-1} (VC)	638 ± 149	631 ± 99	748 ± 75	739 ± 56
Gross margin fattener^{-1} (GM)	254 ± 130	364 ± 75	225 ± 89	275 ± 96
Net benefit ratio (GR/VC)	1.4	1.6	1.3	1.4
Household income capita^{-1} year^{-1}	3,422	4,402	4,613	5,947
Price per kg of live weight	14.74	15.36	14.32	14.61

Notes: Table reports means and standard deviations.

Higher gross margins and higher per capita income among households with preferred traders seem to be achieved through higher farm-gate prices – despite higher net marketing margins in the marketing channel. Trading relations have a positive effect on prices per kg of live weight. Prices also differ between the two types of pig genotypes, particularly when farmers have a preferred trader. Ban fatteners sold in a marketing arrangement without a preferred supplier still

reach higher prices than LWxMC fatteners with a preferred trader and raise the question in how far Ban keeping could lead to improved production economics and higher incomes for small farmers.

Impacts of breeds and trading relations

A simple comparison of means does not provide meaningful insights, as different factors might affect production economics and household income simultaneously. In order to take account of these factors, multiple regression models are used. While controlling for the impact of covariates, it is aimed to estimate the isolated impact of Ban pigs and trading relations on production economics and household income:

$$Y_i = \gamma_o + ß_i X_i + \delta_j Z_j + \alpha_1 D_1 + \alpha_2 D_2 + \alpha_3 D_3 + \varepsilon_i$$

Y_i is the gross margin per fattener or household income per capita. γ_o is a constant term. X_i is a vector of production specific variables and Z_j a vector of farm and household characteristics. These variables serve as controlling covariates. Our main interest is in the treatment variables: D1 is a dummy variable for households keeping MC pigs and having trading relations, D2 is a dummy variable for households keeping Ban pigs and having trading relations, D3 is a dummy variable for households keeping Ban pigs and having no trading relations. MC keeping households without trading relations serve as the reference group. ε_i is an error term capturing the impact of unobservable variables.

Table 4: Factors influencing gross margin per fattener

		Sample statistics		OLS regression model	
		Mean	SD	Coef.	S.E.
Treatments:	Mong Cai with trading relations	0.19	-	5.49	55.57
	Ban with trading relations	0.26	-	131.34**	51.73
	Ban without trading relations	0.46	-	57.57	56.32
Covariates:	Number of fatteners raised (unit)	9.94	4.73	11.50**	5.17
	Quantity maize per fattener (kg)	152.24	33.96	.56	.47
	Quantity concentrate per fattener (kg)	18.87	10.59	1.97	1.69
	Hours per fattener	91.20	44.05	1.05**	.39
	Education of household head (years)	5.51	2.06	2.09	7.20
	Constant	-	-	-122.43	137.77
Summary stat.:	F-value	3.407			
	R^2	0.309			

Notes: Dependent variable is gross margin per fattener in VND 1,000.
Table reports means, standard deviations, coefficients, and standard errors.
For treatments, MC keepers without trading relations serves as the reference group.
*** significant at 1%, ** significant at 5%, *significant at 10%

The results of the estimated regression model indicate a positive effect of Ban pig keeping with trading relations on gross margins (Table 4), i.e. if a farmer keeps Ban fatteners and simultaneously cooperates with his preferred buyers, he will earn a gross margin, which is around VND 131,300 higher than MC keepers without a preferred buyer. These results apply once we control for the number of fatteners raised on a farm and different inputs used in pig production.

In order to know whether the integration of Ban pig keeping and trading relations have an impact on per capita household income, another regression model is estimated (Table 5). For Ban pig keeping with or without trading relations, no significant effect is detected by the model. This might be because we control – in addition to standard socio-demographic household variables – for production intensity by the concentrate variable, i.e. on the same level of intensity Ban

keepers achieve the same level of household income than MC keepers without a preferred buyer. On the other side, MC keeping with a preferred trader has a significant effect on per capita household income, i.e. MC keepers can profit from a preferred trader relationship in terms of higher per capita incomes. In Ban keeping households higher gross margins per fattener do not lead to higher household incomes.

Table 5: Factors influencing household income per capita per year

		Sample statistics		OLS regression model	
		Mean	SD	Coef.	Std. Error
Treatments	Mong Cai with trading relations	0.19	-	1139.90*	614.81
	Ban with trading relations	0.26	-	654.15	588.59
	Ban without trading relations	0.46	-	918.59	632.23
Covariates:	HH head (1 man, 0 women)	0.94	-	-687.30	642.38
	Education of household head (years)	5.51	2.06	191.77**	84.78
	HH size (number of labor)	2.93	1.08	-590.19**	177.12
	Dependent ratio on main labor (times)	2.01	.59	-1111.4***	286.92
	Land area per HH member (m2)	2,063	585.9	1.26***	.27
	Age of household head	40.9	8.07	72.71***	19.46
	Quantity concentrate per fattener (kg)	18.87	10.59	31.17*	18.07
	Number of fattener raised	9.94	4.73	70.03	47.63
	(Constant)	-	-	170.10	1756.71
Summary stat.:	F-value	14.81			
	R^2	0.67			

Notes: Dependent variable is per capita household income in VND 1,000.
Table reports means, standard deviations, coefficients, and standard errors.
For treatments, MC keepers without trading relations serves as the reference group.
*** significant at 1%, ** significant at 5%, *significant at 10%

Conclusions

Long-term trading relations with buyers of pigs bring many advantages for local producers such as higher prices, reliable information, on time payment, and lower transaction costs. However, few households have such kind of trading relations, which indicate a generally not well-integrated market in the mountainous North of Vietnam. Ban pigs are highly appreciated and yield higher farm gate prices than LWxMC – despite the fact that marketing efficiency is lower in Ban marketing channels than in MC marketing channels.

On the background of the marginalization of small pig producers in the highlands of Northern Vietnam, a comparison regarding production economics and impact on per capita income was conducted. Trading relations bring higher gross margins per fattener for households producing Ban pigs. Ban keeping, however, has no significantly statistic influence on household income per capita. Only MC keeping with trading relations does improve per capita household income.

Our results indicate that supporting and promoting trading relations can improve the economics of pig production for households keeping Ban pigs, especially poor producers in remote areas. We could, however, not confirm a significant impact on household income.

Acknowledgements

The financial support granted by the Eiselen Foundation is gratefully acknowledged.

References

Cuong, T.H., 2002. Pork production and marketing at farm households in Hanoi. Technical report No 6. HAU-JICA ERCB Project Office. Hanoi.

Cuong, T.H., 2004. Study on Current and Potential Market Supply and Demand, Marketing Opportunities and Consumer Preferences for Indigenous Breed Animals/Products. Market and Marketing GEF-UNDP 2715-03-4709. Final report. Development and Application of Decision-Support Tools to Conserve and Sustainably Use Genetic Diversity in Indigenous Livestock and Wild Relatives Livestock, Hanoi.

ILRI (International Livestock Research Institute), 1995. Livestock policy analysis. ILRI Training manual 2. Nairobi, Kenya. Chapter 5.

Lapar, M.L, Binh, V.T., and Ehui, S., 2003. Identify barriers to entry to livestock input and output markets in Southeast Asia. Food and Agriculture Organization of the United Nations (FAO), Rome.

NIAH (National Institute of Animal Husbandry), 2003. The Vietnamese National Country Report on Animal Genetic Resources. Country Report. Hanoi.