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Household pork consumption behavior in Vietnam: Implications for pro-smallholder pig value chain upgrading

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Pork represents more than 70% of meat consumption in Vietnam, and pig production provides livelihood for more than 4 million small farmers in the country. Understanding pork consumption behavior is thus important for upgrading the pig value chains in Vietnam. The study is conducted with 416 households in Hung Yen and Nghe An provinces. The results confirm that pork is the most widely eaten animal source food in Vietnam (about 24.7 kg/capita/year), consumed by more than 95% of the population of different ages and gender. A household spends about USD 30 monthly for pork, accounting for 13% of total food expenditure. Meanwhile, other types of meat appear to be weak substitutes to pork. While consumers select market outlets for pork based on cleanliness, trust in sources, and the absence of disease in pork sold, 99% of them still buy meat in traditional, wet markets. This, coupled with the fact that meat quality is not traceable in the value chain and only 3% of respondents trust their regular meat supply, implies that the pig value chain, especially the formal/modern retailing sector in Vietnam, has not yet gained consumer trust. Given saturated pork demand with more than 95% of respondents planning to sustain or decrease their pork consumption, it's unlikely that pork consumption behavior will significantly change for the majority of Vietnamese consumers. Several potential implications are drawn for upgrading the pig value chains: (i) Organizing small farms into groups applying good practices that allow meat to be traceable and certified by trusted institutions; (ii) Developing a quality assurance system that can be feasibly established under smallholder conditions, and complies with minimum quality and safety standards tailored to Vietnam's context, (iii) Strengthening capacity to collect appropriate market information to provide pig producers, particularly smallholders, reliable meat demand and supply forecast to better serve their target consumers; and (iv) Improving cost and quality competitiveness in pig value chains. These are important considerations especially when Vietnam becomes deeply integrated into the global and regional markets when the Trans-Pacific Strategic Economic Partnership Agreement is officially put into practice.

Keywords: Value chain upgrading, pork consumption, smallholder market

Introduction

The pig sector consistently contributes about 74-80% of total meat production in Vietnam during the period 2000-2012 (Nga et al, 2013) and provides livelihood for about 4.13 million small farm households in the country (GSO, 2011). In 2012, per capita consumption of meat was estimated

at 21.6kg, an increase of about 38% from 2002 (GSO, 2014). Rising income is one of the driving factors of pork demand (Tiongco et al, 2008), while changes in lifestyle also affect consumer behavior for food and pork specifically. This coupled with increasing concerns for food safety and diverse choices of food are likely to be the main factors shaping pork consumption pattern in Vietnam. At present, the smallholders provide at least 80% of total pork for domestic consumption that is mainly distributed in wet, traditional markets where food production processes are not traceable and food quality remains a big concern. The pig sector, especially pig smallholders, is likely to be affected in some ways by Vietnam's participation in the WTO, and especially the Trans-Pacific Partnership (TPP) agreement that is currently being discussed for official approval and implementation. This paper aims to characterize consumers' behavior in pork consumption and draw implications for smallholder pig value chains in Vietnam.

Methodology

Data was collected from Hung Yen and Nghe An provinces from a total sample of 416 consumer households and 420 pig smallholders using a structured survey carried out in 2013. Proportional sampling by share of rural urban population and random scheme was applied for consumer households. Random selection of pig smallholders was based on value chain gradient location, namely rural to rural and rural to urban areas. Other actors in the chain (input supplier, trader, slaughter men, retailer) were randomly selected in the same location where the producers were selected and interviewed using structured questionnaires. Descriptive and comparative statistics with simple t-test for mean comparison were used for analysis.

Results and discussions

Household profile. About 80% of households are headed by men, 48 years old on average, of whom 70% finished secondary school, and about one-third are farmers. The main primary economic activities of households are farming (crop and animal), wage employment, and small business. On average, family size is about 4 people (Table 1). The family composition is balanced across gender in general, though in urban households, there are more women than men. About 30% of households have children under 5 years old. On average, per capita income in 2012 is approximately 1380 USD, with urban people having significantly higher income than rural people (Table 1). Most of urban households reported that their monthly income was fairly stable, while those in rural areas experience seasonality in income, largely due to the production cycle. On average, urban household income is roughly 50% higher than rural household income.

Table 1. Monthly household income and food expenditure

	Rural	Urban	All	Difference (rural & urban)
1. Household head education (%)				
High school and lower	87.2	58.8	77.4	
Other	12.8	41.3	22.6	
2. Family size	3.8	3.7	3.8	-0.1^{NS}
	(1.4)	*(1.2)*	*(1.3)*	
3. Per capita income (USD/year)	1,181.6	1,761.9	1,380.7	- 580.3***
	(53.1)	*(95.5)*	*(49.7)*	
4. Per capita food expenditure (USD/year)	678.9	1064.5	809.6	-385.6***
	(21.6)	*(42.6)*	*(22.2)*	

Source: Calculated from survey data, 2013

*Note: *** statistically significant at 1 %. Figures in parentheses are standard errors.*

Food expenditure is estimated at around 810 USD/year/capita, about 58% of total income, which is a bit higher than the national average of 50% (GSO, 2014). Seasonality in food consumption is observed; i.e., highest from November to the following February, largely due to New Year celebration and spiritual festivals. In rural areas, slightly higher food consumption is also observed during rice harvesting season (June-July).

Pork consumption. Pork is commonly consumed by people of all ages and gender. More than 90% of children and adult men and women eat pork, but children tend to consume more lean meat than the other types of meat, while adult men and women prefer mixture meat (Table 2). Pig bone is used by more than 80% of children and adult, although only about one-third of old people consume this part of pig. Fatty meat (commonly used in liquid form as oil) and processed pork (i.e. meat loaf) are found to be the least common types of meat for consumers. Less than 15% of children and adult people eat fatty meat, and less than 50% of them eat processed pork.

Table 2. The diversity of pork consumption in households, by age and gender (as a percentage of total)

Types of pork	Children less than 5	Children above 5 years old	Women	Man	Old people
All	**91.2**	**98.5**	**99.7**	**99.4**	**96.1**
Lean	69.6	70.8	67.8	66.4	63.8
Fatty	7.2	15.3	12.8	13.8	10.2
Mixture	45.6	73.3	78.2	78.2	69.3
Bones	76.0	82.2	85.4	83.6	85.0
Processed	21.6	44.6	43.4	41.5	36.2
Offal	35.2	45.0	48.9	48.0	44.9

Source: Calculated from survey data, 2013

The frequency of pork consumption by people of all ages varies for different types of pork. Adult people eat pork more frequently than children and old people. Lean and mixture meat are used most frequently, of which mixture meat is used in meals in about 8 days per month, followed by lean meat (roughly 6-7 days per month) (Table 3). Bones, usually cooked for soup or fried, is used for about 4-5 days monthly. Fatty meat is less preferred and processed meat and offal is rarely consumed, i.e., about 1-2 times in a month. Rural households tend to use mixture meat more frequently than urban households.

Table 3. Frequency of pork consumption by age and gender (number of days/month)

	Children less than 5	Children above 5 years old	Women	Man	Old people
Lean	2.4	3.7	7.8	6.8	2.6
Fatty	0.4	0.9	1.2	1.3	0.4
Mixture	1.7	4.6	8.5	7.9	2.9
Bones	1.9	2.4	4.7	4.3	1.6
Processed	0.4	1.1	1.6	1.5	0.5
Offal	0.4	0.6	1.2	1.2	0.4

Source: Calculated from survey data, 2013

Pork consumption is estimated at nearly 2.1 kg/capita/month (or 24.7 kg/capita/year) on average; it is not significantly different between urban and rural areas (Table 4). Mixture pork consumption per capita is highest among other types of meat consumed by rural households interviewed. Lean meat consumption per capita is highest among other types of meat consumed by urban households interviewed. On the other hand, processed meat and offal are the least

consumed per capita among all respondent households. On average, a household pays about USD 30 for pork, accounting for about 13% of total food expenditures per month (Table 4).

Table 4. Monthly consumption of pork in 2012

Consumption	**Rural**	**Urban**	**All**	**Differences**
Per capita consumption(kg)	2.01	2.17	2.05	0.16^{NS}
	(0.1)	(0.1)	(0.1)	
Lean	0.54	0.77	0.61	-0.23***
	(0.04)	(0.08)	(0.04)	
Fatty	0.10	0.05	0.08	0.05^{NS}
	(0.02)	(0.01)	(0.01)	
Mixture	0.81	0.65	0.75	0.16*
	(0.05)	(0.07)	(0.04)	
Bones	0.39	0.48	0.42	-0.09*
	(0.03)	(0.04)	(0.02)	
Processed	0.09	0.11	0.10	-0.02^{NS}
	(0.02)	(0.03)	(0.02)	
Offal	0.08	0.11	0.09	-0.03^{NS}
	(0.01)	(0.03)	(0.01)	
Household consumption(kg)	7.26	7.64	7.36	-0.38^{NS}
Total household pork expenditure/month (USD)	29.02	30.58	29.43	-1.56^{NS}
Pork expenditure as % of food expenditure (%)	14.8	9.6	12.4	

Sources: calculated from survey data, 2013

*Note: *, **, *** significant at 10%, 5%, and 1 %, respectively. Figures in parentheses are standard errors.*

Pork is widely available such that consumers can find it from 1-5 places within the vicinity. On average, distance from the consumer's home to the closest pork outlet is around 0.5km. The most regular pork outlet for almost all of consumers is the wet, traditional market; only a few (less than 1% of consumers) buy pork in supermarket and shops (Table 5). About 99% of consumers buy pork in the morning as meat "freshness" (warm meat) is traditionally preferred and pork is not commonly available in rural areas in the afternoon.

Table 5. The most regular sources and time for buying pork (% of households)

	Rural	**Urban**	**Total**
1. Buy pork in wet market	99.6	98.6	99.3
2. Buy pork in supermarket, food shops	0.4	1.4	0.7
3. Buy pork in morning	100.0	93.2	98.8
4. Buy pork in afternoon	0.00	6.85	1.20

Source: Calculated from survey data, 2013

Storage time of meat in the outlet is often considered as the total hours from slaughtering until the meat is sold. As pork is sold as fresh, warm meat, storage time is inversely correlated with perceived meat freshness, which is a preferred attribute by consumers when selecting a seller. About 35% of consumers interviewed reported that storage time of pork in the outlet is a very important criteria (Table 6). Consumers choose pork outlets largely based on trust in the seller and their personal relation with seller. This influences consumers' valuation of unobservable

criteria such as “free-of- illness pork” which is considered very important when buying pork (Table 6). Price, buying in credit, and accessibility are not very important criteria according to the majority of consumers surveyed. Only a few consumers are concerned with packaging. These results imply that it might not be easy for modern pork outlets selling chilled pork to compete with traditional, wet markets, given current consumer preferences for specific attributes in pork and pork products. Also, the reputation of the seller is very important to gain loyalty among regular household customers.

Table 6. The very important concerns in selecting pork outlets and buying pork (% household)

Criteria	Rural	Urban	All
1.Selection of pork outlet			
- Storage time	28.9	46.2	34.9
- Trust in seller/ source	18.7	27.3	21.6
- Personal relation with supplier	16.5	16.8	16.6
- Price	7.7	4.2	6.5
- Accessibility	4.4	9.8	6.3
- Packaging	1.8	2.8	2.2
2.Buying pork			
- Texture (firmness, viscosity & colour)	63.4	72.5	66.5
- Free of illness	59.3	70.6	63.2
- Odour of pork	56.4	71.3	61.5
- Cleanliness of pork	55.3	67.8	59.6
- Water content	20.6	33.1	24.9
- Nutritional value	19.8	34.5	24.8

Source: Calculated from survey data, 2013

Pork is found to be not strongly substitutable with other foods. When prices of other related products change, only less than 5% of consumers decide to change the quantity of pork purchased (Table 7). When pork quality is poor in the outlet where pork is regularly sourced, about 80% of consumers indicate that they would try to find better quality pork in other shops. Quality is likely the most important factor affecting the level of pork consumption. Approximately 15% of consumers planning to buy more if quality is improved, and a relatively higher proportion (40%) of consumers indicate that they are likely to buy less if quality is decreased (Table 7).

Table 7. Consumer’s response in cases of changes in income, pork quality and related product price (% household)

Action	Rural	Urban	All
1. Buy more when			
Income increases	6.2	6.3	6.3
Prices of other products increase	2.9	8.4	4.8
Quality increases	12.5	21.0	15.4
Tet holiday	58.6	42.0	52.9
2. Buy less when			
Income falls	18	12.6	16.1
Prices of other products decrease	2.9	5.6	3.9
Quality decreases	34.4	43.4	37.5

Source: Calculated from survey data, 2013

On average, urban consumers react more strongly to changes in prices of related products and quality of pork than rural consumers (except in the event of Tet holiday), implying that substitution of pork with other meats is likely to be higher in urban areas than in rural areas due to more availability and choices of other commodities as substitutes.
When presented with another scenario of 10% change in pork price, the response by urban consumers seems to be weaker. For example, 11% of urban consumers would buy more if pork price is up by 10%, but nearly 20% of rural consumers would reduce pork consumption (Table 8). However, the majority of consumers choose to maintain pork consumption when pork price changes by 10% (Table 8).

Table 8. Consumer's response in cases of changes pork price (% household)

Behavior	**Price down by 10%**			**Price up by 10%**		
	Rural	Urban	All	Rural	Urban	All
Buy more at the same shop	11.7	8.4	10.6	-	-	-
Buy less at the same shop	-	-	-	19.4	11.2	16.6
Amount changed (kg/hh/month)	1.0 *(0.2)*	0.9 *(0.2)*	1.0 *(0.1)*	-1.0 *(0.1)*	-0.6 *(0.1)*	-0.9 *(0.1)*
Amount change (as % of current consumption)	13.8	11.8	13.6	-13.8	-7.9	-12.2
Unchanged (amount)	83.5	86.0	84.4	76.6	86.7	80.1
Other	4.8	5.6	5.0	4.0	2.1	3.3

Source: Calculated from survey data, 2013

Note: Figures in parentheses are standard errors.

Very low consumer trust in quality and safety of pork sold in markets is found among respondents. Less than 4% of consumers believe that pork sold in markets is safe (Table 9). Quarantine stamping is applied to pork, but only about one-fifth of consumers trust in a quarantine stamp. More than 90% of consumers are willing to buy safe pork at a higher price, with a premium of about 1 USD/kg (Table 9), equivalent to about 20% of the prevailing price. Pork consumption also appears to be reaching the level of saturation, given the current situation of meat quality, income, and other market factors. For example, about 97% of consumers plan to maintain or decrease pork consumption in the foreseeable future (Table 9) (mostly due to quality concerns). This, coupled with the fact that the majority of consumers do not change pork consumption when price changes by 10%, implies that pork consumption may be reaching the level of saturation.

Table 9. Consumer trust and willingness to pay for safe pork (% household)

	Rural	Urban	Total
1. Trust in pork quality and stamp			
Believe that pork sold in the market is safe	4.4	2.1	3.6
Fully trust in quarantine stamp sign on pork	22.7	21.7	22.4
2. Willing to pay for safe pork	91.9	93.7	92.6
Price premium (USD/kg)	1.0	1.2	1.1
3. Pork consumption trend of household in future			
No change	57.0	73.1	62.6
Increase	2.0	6.0	3.4
Decrease	41.0	20.9	34.0

Source: Calculated from survey data, 2013

Pork value chain in Vietnam. More than 80% of pork is being supplied by millions of small farmers (GSO, 2011), who operate at very small scale, mostly from 1-30 heads/cycle. Half of the pigs produced is sold to local slaughter men (Figure 1), who may do slaughtering (normally 1-3 pigs/day), and processing/or and retailing. All slaughter men sell fresh pork to retailers, and/or consumers directly, at wet markets. Along this chain, pork quality/safety is almost not traceable and not certified. Up to present, numerous slaughter men operating at small scale in rural areas have not been under the management of the line agency for food safety and veterinary hygiene. According to the Department of Animal Health (DAH, 2011), nearly half of 462 pork samples collected in 2010 (mostly in wet markets) did not pass the test of veterinary hygiene and food safety requirements, i.e. they contain *Coliforms, E.coli, S.aureus, C.perfringens, and Salmonella* at unacceptable levels.

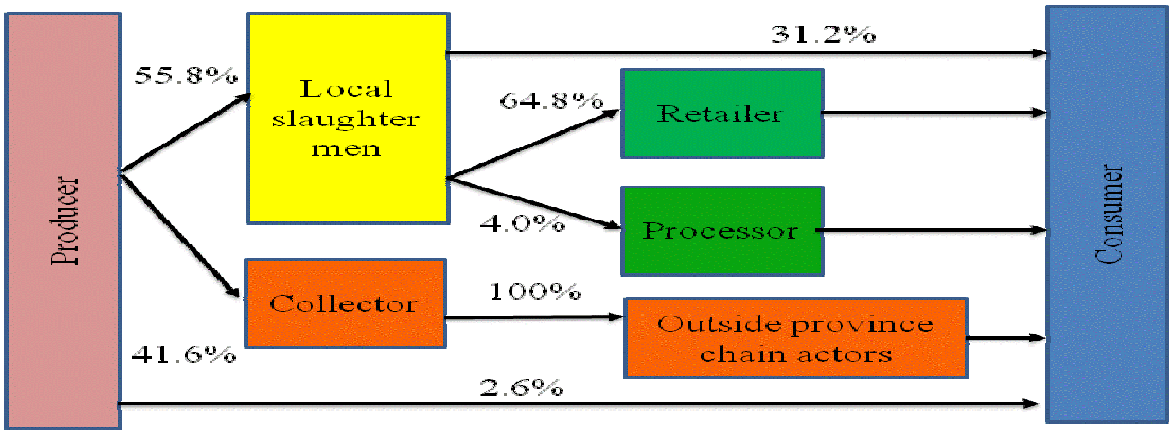

Figure 1. Mapping of local pork value chain of smallholders in Vietnam

Source: Computed from surveyed data, 2013

Integration of Vietnam in the world market. Vietnam joined the WTO and has several FTAs (Free Trade Agreement) at regional level. The tariffs on pork imports had been reduced from about 30% (at WTO entry in 2006) to 15% by 2012. In 2008, imports of meat climbed up to over USD 180 million, almost double that of the previous year's (Nga *et al., 2013),* and domestic pig producers suffered losses due to the dampened price of pork in the domestic market (Nga *et al., 2011).* According to MARD (2015), the volume of meat imported in the first five months of 2015 has increased by about 50% as compared to 2014. Meat imported from the EU has increased 70 times during the period 2012-2014, even before the agreement with the EU on FTA (MARD, 2015). In addition, while the TPP (Trans-Pacific Partnership) agreement of Vietnam has not yet been officially approved[1], chicken importation from the U.S (the leading meat exporter to Vietnam) has increased significantly, reaching 41,600 tons and accounting for nearly 63% of total poultry meat imports (MARD, 2015), resulting to the dampening of chicken (broiler) price to about USD 1/kg, down about 75% as compared to 2008 (MARD, 2015). VEPR (2015) also projects that the meat sector (especially pig) will shrink when the TPP is put into effect, and it is also forecasted that producers' welfare will likely be reduced.

Policy implications. Vietnamese consumers' strong preference for fresh and unchilled pork acts as a "natural protection" from imported chilled or frozen pork (Lapar *et al., 2012)*; however, consumer behavior may change over time due to factors such as changes in lifestyles, income, and awareness of food safety. Low productivity and high cost of pig production (MARD, 2014), the scattered structure of the pork value chain, weak food safety management along the pork value chain, low consumer trust and consumer behavior change are likely internal factors that

[1] The TPP was not yet officially signed at the time that this study was implemented.

will strongly influence the development of smallholder pig systems in the near future. Several potential implications from the results of this study are drawn for upgrading the pig value chains: (i) smallholder pig producers should be organized in groups (or cooperatives), applying good practices such as Vietnam Good Agricultural Husbandry Practices in pig production, and the marketing of pigs through groups/cooperatives is supported by quality certification of trusted institutions; (ii) there is a need to develop a quality assurance system that can be feasibly established under smallholder conditions, and complies with minimum quality and safety standards tailored to Vietnam's context; (iii) strengthening capacity to collect appropriate market information to provide pig producers, particularly smallholders, reliable meat demand and supply forecast to better serve their target consumers; and (iv) improving cost and quality competitiveness in pig value chains. In the short-run, some protective measures could be considered for the meat sector in Vietnam under a more open regional trading regime through the application of technical barriers to trade for imported meats.

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