



## Beef Market Chain and Opportunities for Farmers in Kampong Cham Province, Cambodia

**MIRANDA PEN\***

*University of New England, Armidale, Australia  
Email: mpen@myune.edu.au*

**DARRYL B. SAVAGE**

*University of New England, Armidale, Australia*

**SOPHAL LORN**

*Department of Agriculture, Kampong Cham, Cambodia*

**WERNER STÜR**

*Farm and Agricultural Advisory Services, Queensland, Australia*

Received 26 December 2012 Accepted 26 July 2013 (\*Corresponding author)

**Abstract** Most cattle raising in Cambodia is undertaken by smallholder farmers, based on a system of low nutritional input (crop residues) and high labour input. Options for increasing efficiency and introducing a market-oriented beef production system are considered a priority. This paper reports the outcomes of a cattle market chain study conducted in Kampong Cham province. Three districts were selected: Prey Chhor (paddy area), Tbong Khmum (highland area) and Kang Meas (Mekong area). A rapid market appraisal was conducted by following the market chain from producers to traders. Farmer groups, cattle brokers and small, medium and large traders were informally interviewed. Farmers in Prey Chhor frequently bought and sold draft cattle as a seasonal cycle for rice cropping. Farmers along Mekong area practiced a form of market-orientated production, buying thin cattle from other districts to fatten and sell. At all points of the market chain, interviewees reported that kilogram of meat was the basis of price. Interestingly, sale of raw meat at market (retail) is the only stage of the market chain at which weighing of meat takes place. At all other stages of the market chain, assessment of weight is undertaken by visual assessment and is therefore only an estimate. For breeding animals, their physical appearance rather than production-based measurements is the basis of price. Importantly, meat eating quality was not identified an issue of importance by farmers or cattle traders.

**Keywords** draft cattle, market chain, cattle production system, smallholder farmers

### INTRODUCTION

Demand of meat is the primary driver for a livestock revolution, and in developing countries, poor people are consuming more animal products due to their increased income and urbanization (Dalgado, 2003). With projected population of 0.7 billion in 2005 and 0.9 billion in 2050 in Southeast Asia (SA) (Haub and Kaneda, 2012), annual growth of meat consumption during 1997–2020 is expected to be 3.4% per year in SA and 3.1% per year in China (Dalgado, 2003), where meats are exported to.

As one of the ASEAN (Association of South-East Asian Nations) countries, Cambodia will enter into one economic zone so called ASEAN Economic Community (AEC) by 2015 (ASEAN, 2012). This will promote more opportunities for Cambodia to increase its participation in export markets. However, there are challenges for the Cambodian producers to compete with other countries related to product quality and supply issue.

Cattle population in Cambodia was 3.4 million in 2011, down from 3.6 million in 2009 (MAFF, 2012). Cambodia has had relatively high growth rates of meat production (7.7%) and

consumption (8.6%) since the 1980s (Ahuja, 2012). However, cattle production of the Cambodian farmers is still small in number and is based on low nutritional input and high labor demand (Pen et al. 2009; 2010). Problems resulting from parasites and diseases are still severe for the Cambodian cattle herd (Copeman and Copland, 2008, Nampanya et al., 2011). Interventions to develop livestock sector in this country are very crucial to respond to the market opportunities.

Current cattle markets for the Cambodian livestock are mainly in local markets and in Vietnam, China and Thailand (Sieng et al. 2012). The cattle trading within the country is still modest and is laid in an extensive and traditional system. The understanding of cattle market chain among the farmers and traders will have an implication for cattle development in the country for income generation of smallholders and national economy. There have been studies to understand the livestock movement and disease spreading in Cambodia (Sieng et al. 2012; Kerr et al. 2012; Hawkins et al. 2012), that influenced the focus of the study reported in this paper.

## **OBJECTIVE**

This study aims to analyze factors involving in beef market chain in Kampong Cham province of Cambodia and to discuss the opportunities for them to gain more participation in cattle markets.

## **METHODOLOGY**

A rapid market appraisal (RMA) was used to collect data for this study. Informal interviews and meetings with farmers, brokers and traders were undertaken in Kampong Cham Province, Cambodia. This study were prepared by previous project funded by the Australian Center for International Agricultural Research (ACIAR), namely ACIAR project AH/2003/008 'Improved feeding systems for more efficient beef cattle production in Cambodia'. The project had defined three main sites for testing the adoption of forage planting and developing cattle fattening system. With the assistance of local extension workers for agriculture and head of districts, Prey Chhor (paddy area), Tbong Khmum (highland area) and Kang Meas (Mekong area), were selected based on its topography and agricultural activities. In each of the sites, there were 15 smallholder forage adopted farmers (referring to those who have less than 10 heads of cattle) to join and a series of questions focusing on cattle production purpose, breed selection, buying and selling activities, were asked. Farmers were allowed to discuss and to share their responses while all information were recorded and analyzed by the interview team. Breed type were discussed in the interview process, however, due to inconsistency of definition of breed-type, this data was discarded in the result section.

Five cattle brokers from each site were informally interviewed individually on cattle market network, cattle price and trading margin. With the help of the brokers, three levels of traders were identified: small, medium and large traders based on numbers of cattle traded. Ten smalls traders at commune level (buy and sell cattle; 15 cattle/month), 8 medium traders at district level (up to 60 cattle/month), 6 large traders at provincial level (300 cattle/month) were contacted and interviewed separately. They were invited to the Department of Agriculture in Kampong Cham Province to provide information related to cattle price and trading margin, trade flow and their perspectives on cattle market chain. The data are presented in form of flow chart and tables.

## **RESULTS AND DISCUSSIONS**

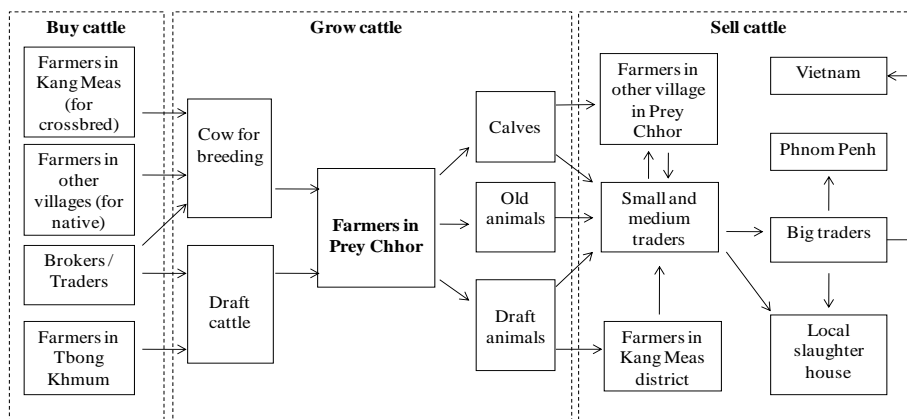
### **Cattle Market Chain of Smallholder Farmers: An Example in Prey Chhor District**

Prey Chhor District is a paddy area in the province. The cattle purchasing (Fig. 1) in this area mainly related to cropping activities (rice growing) because farmers purchased draft animal based on cropping cycle. They also purchased breeding cows from within district (for native cows) or from Kang Meas (for crossbred cows). Brokers and small traders involved more or less in cattle

purchasing in the district depending on their contacts with farmers.

Farmers in Prey Chhor sell calves, old cattle and draft cattle to the market (Fig. 1). Calves were mainly purchased by farmers within village or from nearby village. Small and medium traders played a strong role in purchasing old and draft cattle and in selling to local slaughterhouses or large traders. Large traders sold their stock to local slaughterhouses, or Phnom Penh or to Ho Chi Minh City in Vietnam.

The trade was done on unscheduled timeline with farmers, which means that it could occur anytime farmers wanted to sell their stock. Sieng et al. (2012) reported that to find stock for purchasing, traders contacted producers directly by traveling to their known sources or through phone contacts or family networks. It was clear that farmers did not produce cattle based on planned production. This becomes an issue for traders to optimize their activities on a basis of regular and steady production cycle. Hence, cattle market chain at the district level was generated in a traditional way and farmers’ awareness of market information was limited.



**Fig. 1 An example of cattle market chain of farmers in Prey Chhor District, which is linked with other districts within the province and to market**

\*Broken box indicates cattle trading activities of farmers in Prey Chhor District. Arrows indicate movement of cattle within the chain.

**Table 1 Purpose of cattle production in the three project sites in Kampong Cham, Cambodia**

Purpose of cattle production	Prey Chhor	Tbong Khmum	Kang Meas
Priority 1 – 2 – 3*			
Cow-calf	2	1	1
Drought	1	2	3
Fattening	-	-	2

\*Information from farmer group interviews

### Purpose of Cattle Production

The purpose of cattle produced by farmers in the three project sites were different (Table 1). In Prey Chhor District (paddy area), draft power was the first main purpose, followed by cow-calf production. The later was more prior purposes in Tbong Khmum District (highland area). None of farmers fattened cattle for selling in these two districts. In Kang Meas District (Mekong area), cow-calf purpose was the first priority. Farmers also fattened cattle in this area where feed availability is abundant. As fattening cattle was one of the project objective to increase smallholder cattle herd and individual cattle price, more fattening activities was expected to achieve in others two project sites. This development towards more oriented-market supply will be achievable in case that nutrition of cattle is improved in terms of quantity and quality.

### Cattle Purchasing and Selling Activities of Farmers

Farmers in Prey Chhor (paddy area) purchased draft cattle, mainly directly from farmers along the

river, as a cycle for cropping activity. When they finished the activity, they sold their old stock to farmers in Kang Meas for fattening. The calves were also being sold directly to other farmers or small traders. In Tbong Khmum (upland area), farmers purchased cross-bred cows, mainly through brokers, in order to increase the crossbred type proportion of their herd. They produced calves and steers for breeding or draft purpose to other farmers and old animals to traders. In Kang Meas (Mekong River area), farmers bought thin cattle from Prey Chhor for fattening sale. They might buy through brokers or directly from farmers. They also produced calves for selling and young cattle for breeding or draught. Their fatten cattle were sold to small traders for slaughter.

There was a relationship between how farmers selected the breed of their stock and the purpose of production. In paddy areas such as in Prey Chhor District, where draft power for rice cropping are crucial, farmers preferred to keep the local breed of cattle due to their less feed consumption and more suitable for draft power. In Tbong Khmum and Kang Meas Districts where cow-calf and fattening were the main purpose of keeping livestock, more crossbred cattle, which are larger than the local cattle, were observed. This means that smallholder farmers in these areas have been selecting better and more productive breeds of cattle for their stocks in order to get more benefit from their production.

### **Cattle Price and Trading Margin**

To buy cattle for slaughter, traders estimated the amount of meat on animal and paid for kilogram (kg) of meat on the animal. Interviewees reported that when purchasing breeding cattle, the appearance of body (eg. head, skin, legs), body condition score and health condition were more important. Higher prices were offered to fatter cattle. While animal were not weighed during the purchasing, price were based on an estimation of meat yield per animal. Then traders calculated the value of individual cattle by multiplying its expected meat yield (kg) with a price per kg that they intended to pay. The prices of meat were 11,000-13,000 Riel/kg (~2.75-3.25 USD/kg) for farmers. Big traders in Kampong Cham paid 17,000 Riel/kg (~4.25 USD/kg). Brokers received a commission of ~4 USD per animal sold from both buyer and seller (2 USD from each). Medium and large traders tended to have a profit margin of \$20-25 per animal traded.

Sieng et al. (2012) reported that the demand of red meat within Cambodia is important, but internationally, only the price of meat in the Vietnamese market determined the price of meat in Cambodia. Time of the year is also important determinant of price based on the seasonal supply which is high during festive seasons, for example during Khmer New Year (in April).

### **Trade Flow**

Most often, the large traders purchased cattle through brokers and small or medium traders and paid the original price of cattle plus a marginal price (marginal prices were not disclosed). The large traders interviewed in Kampong Cham estimated that they sold 60% of their cattle to the Vietnamese traders, 30% in Phnom Penh (for slaughters) and 10% to the local slaughters. These traders reported that the market requires that cattle sold to Vietnam and Phnom Penh must have at least 50-70 kg meat/animal. Larger animals with more meat were preferred. The Vietnamese traders paid ~17,000 Riel (4.25 USD) for thin cattle and ~20,000 Riel (5 USD) for fat cattle per kilogram of meat. Interestingly, sale of raw meat at market (retail) is the only stage of the market chain at which weighing of meat takes place. At all the other stages of the market chain, assessment of weight is undertaken by visual assessment and is therefore only an estimate.

The trade of live animals is unreliable to predict because the formal trade is still small and informal trade of live animals across the region is significant (Ahuja, 2012). Livestock trade (moving in and out) in Cambodia was unrecorded (Hing et al. 2007). Thailand is a big producer and exporter of large animals in the region. Cambodia (and Laos) is considered as a transit country for live animal movement from Thailand to high-value markets in Vietnam and China (Kerr et al. 2012). Competition of Thai cattle going to Phnom Penh and Vietnam became a threat to the Cambodian farmers.

### **Farmer's Perceptions on Cattle Market**

Farmers were thinking of how to make more profit from their small number of cattle. They understood that good health condition and fat cattle were easier to sell than thin cattle but they were not aware on how the prices were given by buyers/traders. They chose to keep their cattle longer rather than selling when the prices were low, thus they were not aware of extra input cost of labor and feeds during the delayed period. They tried to avoid trading costs made by brokers or small traders because they preferred to sell/buy directly to/from others farmers.

### **Trader's Perspectives on Cattle Trading**

Traders did not think that supply/demand of cattle market would be a big issue for them to trade. Hence, the expansion of business was their main focus, but lack of capital limit their business. Besides these internal factors, they also mentioned some external factors that would be the issues for their trading. For example, there has been an increase of competition of cattle coming from Thailand to Phnom Penh and Vietnam. They recognized that Thai cattle were hard to compete with using local cattle that were produced by smallholder farmers. They explained that Vietnam market for cattle was a driver for cattle price in Cambodia that is in consistency with Sieng et al. (2012).

### **Opportunities for Smallholder Farmers**

Vietnam and China will become key importing nations to meet their growing demand for foods although their productions are increasing each year (Ahuja, 2012). The ruminant meat, which come from mixed crop-animal system, will play the most important role for meat consumption in those countries (Devendra, 2002) beside pork and poultry meats which have the main source of animal protein.

Due to small demand of meat in the country (Kerr et al. 2012), Cambodia is also exporting cattle to Ho Chi Minh City. The demand of red meat in Cambodia is also increasing, hence strong supply of in-country consumption and exportation must be secured. At the same time, the safety must be considered, because trans-boundary diseases, such as foot-and-mouth disease (FMD), has been a major issue for cattle trading (Sieng et al. 2012).

Cattle nutrition in the developing countries depends on roughage and straws from crops that normally are sufficient in nutrients only for maintenance, but not for production, so supplementation of energy, protein and minerals are required (Leng, 1990). As supplementing concentrated feed and/or urea to low-quality diet was not cost-effective for farmers, leguminous forage may be an ideal solution for smallholder farmers (Pen et al. 2012).

The expected future growth of smallholder livestock will have potential impact on the livelihood of rural poor, hence on poverty reduction. However, the market participation of smallholder farmers must be secured. The main constraint in linking smallholders to markets was not only the production-level, but also the challenge of making efficient transactions between smallholder producers and the downstream players in the value chains (Ahuja, 2012). As it can be seen the cattle market chain in this study, many stakeholders involved in the transaction and trading margin was still high. Improving producer knowledge about market opportunities and the production techniques to produce acceptable products for market is the key for the success of smallholder cattle business.

## **CONCLUSION**

There is a move towards raising more crossbred cattle, which are larger than local cattle and bring a higher price. The price of cattle was related to the estimated amount of meat on the animal, so larger and fatter animals demanded a higher price. Neither farmers nor traders mentioned meat quality as a key factor in the business. There is big opportunity for farmers in Cambodia to produce fat, crossbred cattle for city markets. This needs better feeding and management practices.

Increasing market participation of smallholder farmers is also important in Cambodia. This needs some interventions such as rural infrastructure, appropriate technology transfer and a better delivery system of live cattle aiming to support the small-scale producers.

## **ACKNOWLEDGEMENTS**

This work was funded by the Australian Center for International Agricultural Research (ACIAR). We are thankful to Dr Sorn San, Dr Sar Chetra, Dr Seng Mom, Mr Chieng Sarith, Mr Chim Simach, Mr Cheun Chet for discussion on study design and data collection.

## **REFERENCES**

- Ahuja, V. 2012. Emerging production and market environment for livestock in the Mekong region: opportunities, challenges and the response. In; *Animal Biosecurity in the Mekong: Future Directions for Research and Development*. L.B. Adams, G.D. Gray and G. Murray (eds). ACIAR Proceedings No. 137, 40-44. Australian Center for International Agricultural Research, Canberra, Australia.
- Association of Southeast Asian Nations. 2012. ASEAN Economic Community Handbook for Business 2012. ASEAN Secretariat, Jakarta, Indonesia.
- Copeman, D.B. and Copland, R.S. 2008. Importance and potential impact of liver fluke in cattle and buffalo. *ACIAR Monograph Series*, 133, 21. ACIAR, Canberra, Australia.
- Delgado, C.L. 2003. Rising consumption of meat and milk in developing countries has created a new food revolution. *The J. of Nut*, 133(11), 3907S-3910S.
- Devendra, C. 2002. Crop-animal systems in Asia: future perspectives. *Agri. Syst.*, 71(1), 179-186.
- Haub, C. and Kaneda, T. 2012. 2012 World Population Data Sheet. Population Reference Bureau, Washington D.C., USA.
- Hawkins, C., Sieng, S. and Kerr, J. 2012. Livestock trading and foot-and-mouth disease risk. In; *Animal Biosecurity in the Mekong: Future Directions for Research and Development*. L.B. Adams, G.D. Gray and G. Murray (eds). ACIAR Proceedings No. 137, 73-89. Australian Center for International Agricultural Research: Canberra, Australia.
- Hing, V., Chan, S. and Sok, S. 2007. Cambodia's agricultural production and trade. *Cambodia Economic Review* 3, 69-91. Economic Institution of Cambodia, Phnom Penh, Cambodia.
- Kerr, J., Sieng, S. and Scoizec, A. 2012. Working with traders to understand livestock movements and spread of animal diseases in Cambodia and Lao PDR. In; *Animal Biosecurity in the Mekong: Future Directions for Research and Development*. L.B. Adams, G.D. Gray and G. Murray (eds). ACIAR Proceedings No. 137, 59-64, Australian Center for International Agricultural Research: Canberra.
- Leng, R.A. 1990. Factors affecting the utilization of poor-quality forages by ruminants particularly under tropical conditions. *Nut. Res. Rev.*, 3(1), 277-303.
- Ministry of Agriculture, Forestry and Fishery 2012. Cattle production statistics. (retrieved: <http://www.stats.maff.gov.kh/>. Accessed: 12 December 2012).
- Nampanya, S., Suon, S., Rast, L. and Windsor, P.A. 2011. Improvement in smallholder farmer knowledge of cattle production, health and biosecurity in Southern Cambodia between 2008 and 2010. *Transb. and Emer. Dis.*, 59(2), 117-127.
- Pen, M., Savage, D., Stür, W., Lorn, S. and Seng, M. 2010. Cattle feeding and management practices of small-holder farmers in Kampong Cham Province, Cambodia. *Inter. J. of Env. and Rur. Dev.*, 1-1, 132-138.
- Pen, M., Savage, D., Stür, W. and Seng, M. 2009. Constraints to cattle production of small-scale farmers in Kampong Cham Province, Cambodia. In: *Conference on International Research on Food Security, Natural Resource Management and Rural Development*. University of Hamburg, October. 6-8.
- Pen, M., Savage, D.B., Nolan, J.V. and Seng, M. 2012. Effect of *Stylosanthes guianensis* supplementation on intake and nitrogen metabolism of *Bos indicus* cattle offered a basal diet of mixed rice straw and tropical grass. *J. of Anim. Pro.* (in press).
- Sieng, S., Hawkins, C., Madin, B. and Kerr, J., 2012. Characteristics of livestock traders and trading in Cambodia. In: *Animal Biosecurity in the Mekong: Future Directions for Research and Development*. L.B. Adams, G.D. Gray and G. Murray (eds). ACIAR Proceedings No. 137, 45-58. Australian Center for International Agricultural Research: Canberra.