

Behaviours of restaurants in a beef value chain in Dien Bien province

Bui Van Quang^{1*}, Nguyen Thi Duong Nga¹, Pham Van Hung¹, Duong Nam Ha¹,
Tran The Cuong¹, Han Anh Tuan², Le Thi Thanh Huyen², Stephen Ives³

¹Faculty of Economics and Rural Development, Vietnam National University of Agriculture,
Trau Quy Town, Gia Lam District, Hanoi, Vietnam

²Department of System Research and Livestock Environment, National Institute of Animal Science,
9 Tan Phong Street, Thuy Phuong Commune, Bac Tu Liem District, Hanoi, Vietnam

³College of Business and Economics, University of Tasmania, Centenary Building, Grosvenor Street, Sandy Bay, Tasmania, Australia

Received 11 January 2023; revised 3 March 2023; accepted 28 March 2023

Abstract:

This study explores the behaviours of restaurants and food stores as meat consumption agents in the beef value chain in Dien Bien province by utilising survey data and focus group discussions (FGDs) with restaurant and eatery owners in Dien Bien Phu city and the town of Tuan Giao. Descriptive statistics, T-tests, and Chi-squared tests are used to analyse the data. The research results showed that restaurants and eateries use fresh beef and imported beef. They buy fresh beef daily and mainly from slaughterhouses, wholesalers, and retailers. The important criteria for beef selection are freshness, stickiness, and colour, and owners prefer local beef because it is more suitable for local dishes. In general, restaurants do not face many difficulties in sourcing meat, but sometimes they cannot buy the desired amount of meat and are afraid of receiving buffalo meat instead of beef...The high price of fresh beef is a problem for them as it increases the cost of doing business and reduces competition. In addition, the trend of changing culinary styles with dishes made from imported beef brings both opportunities and challenges for cattle farmers in Dien Bien province. On that basis, this article proposes several solutions related to supply development as well as building linkages to ensure traceability.

Keywords: beef value chain, consumption, Dien Bien, restaurant.

Classification numbers: 2.2, 7

1. Introduction

Restaurants, hotels, and other food service providers are important customers in the meat value chain, especially in processing fresh meat into dishes [1]. The COVID-19 pandemic, with the closure of restaurants and eateries, has reduced meat consumption by up to 25% and has had a major impact on the meat value chain in Pakistan [2]. Despite this, the study of restaurant behaviours is generally more concerned with the role of restaurants in the food value chain, creating added value through the processing of various dishes, and less often analysing the behaviours of restaurants and eateries as a buying agent in the fresh meat value chain. In a locality, small restaurants or eateries are also important consumers as fresh meat is an indispensable ingredient for creating signature dishes [3]. J. Dzanja, et al. (2013) [4] analysed beef value chains in Central and Southern Malawi, and restaurants were identified

as one actor in the value chain. USAID (2018) [5] also identified that restaurants are an important node in meat value chains. Restaurant actors, however, are not analysed in detail in these studies. Safefood (2008) [6] highlighted that restaurants are required to provide information to consumers on the country of origin of any beef served on the premises. However, consumers were also dubious about believing origin claims on menus, citing that restaurants would alter their beef sources.

Dien Bien is a north-western province with the potential to raise ruminants for meat (buffalos and cows). In 2021, the total beef cattle population was recorded at about 94,000, ranked 6th among the 14 provinces in the northern midlands and mountains, and ranked 28th among the 64 provinces in the country [7]. Cattle production has gained the attention of the provincial People's Committee. This is considered one of the economic development directions to

*Corresponding author: Email: bvquang@vnua.edu.vn

serve the restructuring of the livestock sector as well as the agricultural sector of the province. The provincial People's Committee has many policies to develop cattle production in general and beef cattle in particular. In 2008, the Australian Centre for International Agricultural Research (ACIAR) sponsored the project LPS/2008/049 "Overcoming technical and market barriers for more efficient beef cattle raising in the Northwest of Vietnam", which was implemented in the period 2011-2015 [8]. The research results showed that the local beef value chain plays an important role for cattle farmers in Dien Bien province. In 2018, the LPS/2015/037 project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam" (implemented in the period 2018-2022) focused on approaching the value chain in the development of beef cattle breeding and selected Tuan Giao and Dien Bien districts for technical and economic interventions. In particular, restaurants and eateries are important actors in the beef value chain here [9], which is the consumption agent of beef in large quantities. However, the behaviours of this agent in the beef value chain have not been well analysed. This study aims to analyse the behaviours of restaurants and eateries in the beef value chain of Dien Bien province and identify opportunities as well as proposed solutions to upgrade the beef value chain to better meet the needs of consumers.

2. Methodology

Secondary data was collected through reports from the Department of Statistics of Dien Bien province and other departments related to agriculture and animal husbandry. Primary data was collected through a survey and group discussion. The total number of surveyed samples was 12 restaurants and 48 eateries in 2019, in Dien Bien Phu city and the town of Tuan Giao, including restaurants in the Muong Thanh and Him Lam hotels. The sampling method was convenience sampling [10]. In addition, three FGDs were conducted with restaurant owners with a total number of 16 participants.

The method of data analysis used was descriptive and comparative statistics with the t-test for the mean comparison and Chi-squared test for proportions. The sample was classified into two groups including restaurants with the number of people served = 100 people/day or more and those having business registration and serving less than 100 people/day.

3. Results

3.1. Overview of the beef value chain in Dien Bien province

The beef value chain in Dien Bien province has similar functions and characteristics to other meat value chains (pig and poultry) including input supplier, producer, collector, slaughterhouse, wholesaler, retailer, and consumer (Fig. 1). The main inputs for beef/cow production are calf, grass, and veterinary drugs. Households also raise cows to provide calves by themselves.

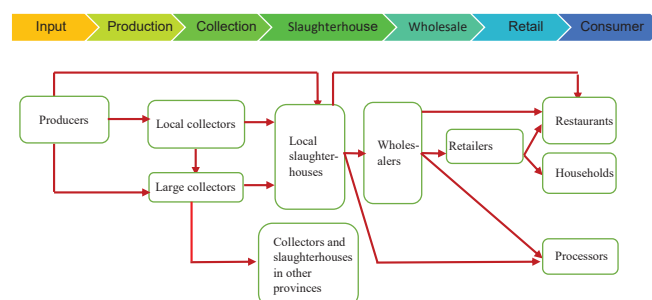


Fig. 1. Map of beef value chain in Dien Bien province [9].

Small-scale households mainly raise beef cattle. In the province, there are several large-scale farms and households engaged in fattening activities. These households sell beef cattle to local or large-scale collectors outside the province. Slaughterhouses may also directly collect beef cattle from these households for slaughter, sell them to other collectors, or sell them to households fattening beef cattle. In Dien Bien and Tuan Giao districts, there are no large slaughterhouses, only small slaughterhouses with a scale of fewer than 5 heads/day. The customers of these slaughterhouses are retailers in markets, restaurants, eateries, households/meat processing facilities, and household consumers. Restaurants and eateries mainly consume grade-A meat including tenderloin and thigh meat. Horizontal linkages in the beef value chain in Dien Bien have been established and developed recently. In 2021, there were two cooperatives raising ruminants and twelve cooperatives supplying services for raising and marketing ruminant products. However, the vertical linkages in the beef value chain in Dien Bien have not been developed. There is no official link between the actors in the beef cow value chain in Dien Bien province. The relationship between restaurants and eateries with the slaughterhouses is relatively closer with restaurants and eateries notifying the quantity and type of beef to slaughterhouses by phone the day before delivery.

3.2. General information on restaurants in the Dien Bien beef value chain

The average age of restaurant owners is quite young, around 43 years old, and there is no difference between groups of restaurants. There is also quite a balance of gender, with about 50% of the food service establishments operated by women, and the rest are operated by men (Table 1).

Table 1. General information about the owners of restaurants.

Item	Casual dining (n=48)	Restaurant (n=12)	Average (n=60)	P-value
1. Age (years)	42.90	43.33	42.98	0.89 ^{NS}
2. Gender (%)				
Male	54.17	33.33	50.00	0.197 ^{NS}
Female	45.83	66.67	50.00	
3. Ethnic group (%)				
Kinh	91.67	75.00	88.33	0.108 ^{NS}
Thai	8.33	25.00	11.67	
4. Schooling year (years)	9.90	10.58	10.03	0.544 ^{NS}
5. The average number of customers per day	66.81	213.33	96.12	2.0 ^{***}
6. Quantity of meat processed in a day (kg/day)				
Pork	3.09	14.70	5.81	9.47E-06 ^{***}
Poultry meat	4.84	10.50	6.00	0.02 ^{**}
Beef	3.82	5.98	4.22	0.109 ^{NS}

Note: *** is significant at 1%. ** is significant at 5%. NS is not significant at 10% probability level. T-test for mean comparison and Chi-squared test for proportions. Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

In terms of ethnic composition, the majority of restaurant and diner owners are Kinh ethnic people (about 80% of the sample). Most of them have finished high school, with an average number of 10 schooling years. The average daily capacity varies significantly between restaurants and eateries, with the serving ratio close to 70 for casual dining and 213 for restaurants (Table 1). Restaurants serve on a larger scale and with better facilities. High-class restaurants in the study area include the Huong Dong Noi restaurant, Song Hy restaurant, and Dien Bien Muong Thanh restaurant, including restaurants specializing in ethnic dishes made from beef such as the Quan Ethnic restaurant. Smaller-scale eateries, which usually serve breakfast needs (rice vermicelli, noodle soup) and rice rations (low-cost eateries) have

emerged more than snack eateries and street eateries which serve mainly younger customers with dishes such as hot pot, grilled dishes, and Korean-style barbeque. The meats mainly used in restaurants and food stores are pork, poultry, and beef. The average meat consumption per day of restaurants is much higher than that of eateries due to larger serving sizes with 14.70 kg of pork, 10.50 kg of poultry, and 5.98 kg of beef for restaurants and 3.09 kg, 4.84 kg, and 3.82 kg, respectively, for casual dining. Restaurants use more pork and chicken than casual dining, but the amount of beef used is not significantly different between these two types of food service (Table 1).

3.3. Beef consumption behaviour of restaurants and casual dining

The main supplier of beef to restaurants and eateries is the retailer (about 2/3 of restaurants and eateries). The rest comes mainly from slaughterhouses and wholesalers. Small eateries tend to buy more beef from retailers outside the market, mainly due to small volume. Restaurants and hotels buy beef from slaughterhouses, wholesalers, and retailers, and usually they have a few regular suppliers. For hot pot stalls, they buy imported beef (frozen beef) at local supermarkets. Most small restaurants often buy directly at the place of sale (slaughterhouses, wholesalers, or retailers), and restaurants often have been delivered to their establishment (Table 2). Some restaurants and stalls choose to go to the slaughterhouse to buy beef because they are worried that beef can be mixed with buffalo meat if purchased at the market. Restaurants and eateries buy fresh beef every day, for imported meat they can buy large volumes and store them in the freezer for many days. There are significant differences in the choice of beef supplier and the location of beef purchase between restaurants and eateries.

Table 2. Buying sources and locations of interviewees.

Item	Casual dining (n=48)	Restaurant (n=12)	Average (n=60)	P-value
Buying sources (%)				
Slaughterhouse	10.42	33.33	15.00	0.021 ^{**}
Wholesaler	14.58	33.33	18.33	
Retailer	75.00	33.33	66.67	
Buying methods (%)				
Buying at seller's place	75.00	33.33	66.67	0.006 ^{***}
Buying at buyer's place	25.00	66.67	33.33	

Note: *** is significant at 1%. ** is significant at 5% (Chi-squared test). Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

The relationship with the seller is considered very important for the owner of the restaurant. Long-term relationships have benefits for both parties. For the restaurant, it is provided with sufficient quantity and the quality of the meat is guaranteed and at a reasonable price. Therefore, owners often prefer to buy meat from suppliers with long-term relationships. The next criterion is to choose sellers who have a superior sources of goods to ensure the quantity of meat that restaurants and eateries desire (Table 3). Hygiene at the place of supply (slaughterhouses, wholesale/retail) is also considered, especially for restaurants. Other criteria such as the distance to the location to buy meat or the price are less important, "beef prices are already high and there is almost no significant difference between places, so it is not too important". There is no statistically significant difference in the scores of the two groups (Table 3).

Table 3. Criteria for choosing the suppliers and types of beef.

Item	Casual dining (A) (n=48)	Restaurant (B) (n=12)	Average (n=60)	Difference (A-B)
<i>Criteria for choosing the suppliers</i>				
Relationship with suppliers	8.91	9	8.93	-0.09 ^{NS}
Availability level	8.38	8.38	8.38	-0 ^{NS}
Hygienic situation at buying places	7.93	8.5	8.03	-0.57 ^{NS}
Distance to buying places	6.46	5.86	6.36	+0.6 ^{NS}
Price	6.01	7.61	6.33	-1.6 ^{NS}
<i>Criteria for choosing beef</i>				
Freshness	9.22	9.73	9.32	-0.51 ^{NS}
Stickiness	9.17	9.33	9.2	-0.16 ^{NS}
Colour	8.17	8.64	8.27	-0.47 ^{NS}
Texture	6.9	8.21	7.12	-1.31 ^{NS}
Smell	6.76	7.67	6.93	-0.91 ^{NS}

Note: From 1-10, 1 least important, 10 most important, NS is not significant at 10% probability level (T-test). Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

The quality of meat is especially important for restaurants, thus, they choose meat very carefully. The most important criterion is freshness as it determines the taste of the dish, especially dishes where meat is less processed such as pho and vermicelli (FGD). The stickiness and colour of meat are also important criteria for restaurants and eateries because fresh

meat often has a high stickiness and red colour, requiring flexible meat that can stick to the knife. Restaurants and eateries are also interested in meat fibres and prefer beef with small, smooth meat fibres because they believe it to be from local cows (FDG). Owners were also interested in the smell of meat, because through smelling the meat, it was possible to detect the freshness of the meat, or whether the beef came from a diseased cow.

Table 4. Types of beef daily purchased by restaurants (kg/day).

Type of beef	Casual dining (A) (n=48)	Restaurant (B) (n=12)	Average (n=60)	Difference (A-B)
Corn	2.31	4.38	2.71	-2.07***
Bacon	1.81	12.67	3.98	-10.86**
Sirloin	2.22	3.63	2.42	-1.41 ^{NS}
Organs	1.54	1.58	1.56	-0.04 ^{NS}
Flank steak (Nạm)	1.00	0	1.00	+1 ^{NA}
Brisket	0.83	0	0.83	+0.83 ^{NA}
Tail	1.55	0	1.55	+1.55 ^{NA}

Note: *** is significant at 1%. ** is significant at 5%. NS is not significant at 10% probability level (T-test). Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

In general, restaurants and eateries all use beef in their dishes, while eateries tend to use more types of meat due to a wider variety of beef dishes. The types of beef commonly used in restaurants and eateries are corn, bacon, and sirloin (Table 4) with an average daily consumption of 2.31 kg of corn, 1.81 kg of bacon, 2.22 kg of sirloin; this figure is 4.38, 12.67, and 3.63 kg for restaurants, respectively, and there is a significant difference in purchasing amount of corn and bacon between the two groups. In comparison with the size of servings, the volume of beef in restaurants is quite high compared to restaurants, mainly because many restaurants specialize in noodles and drinking dishes, so beef ingredients account for greater proportions. Some restaurants process local dishes such as beef skin effigy, beef tendon soup, beef tail with foil, beef tail stew, stir-fried dishes, and grilled with offal or winged (FGD). Restaurants and eateries often buy more if customers order, or on weekends, especially in the city. November and December of the lunar calendar every year is a time when demand also increased due to the need to eat at festivals, weddings, and meetings.

In general, restaurants and eateries have not yet encountered the situation of not being able to buy beef because they have a few supplier options, and in general slaughterhouses operate quite regularly (FGD). In a situation where beef is not available at the source, restaurant and diner owners react quite differently, while diner owners will find the right type of beef at other stores (27% of diner owners), restaurants will either buy the same type of beef, or they will switch to another type of beef or wait to buy it later (Table 5).

Table 5. Responding of casual dining and restaurants in some scenarios (%).

Item	Casual dining (n=48)	Restaurant (n=12)	Average (n=60)
<i>Desired beef is not available</i>			
Wait and come back later	4.17	8.34	5.00
Buy different types	2.08	8.33	3.34
Go to other outlets to buy desired beef	27.08	8.33	23.33
Not applicable	66.67	75.00	68.33
<i>Low quality beef</i>			
Buy less amount	4.17	8.33	5.00
Buy other types at the same outlet	2.08	0.00	1.67
Go to other outlets to buy desired beef	93.75	91.67	93.33
<i>Lower price</i>			
Buy more at the same outlet	2.08	8.33	3.33
Buying amount is not changed	97.92	91.67	96.67
<i>Higher price</i>			
Buy less at the same outlet	2.08	8.33	3.33
Buy other types	16.67	16.67	16.67
Buying amount is not changed	81.25	75.00	80.00

Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

While there are fewer problems with the quantity of meat desired, most restaurant owners have encountered a situation in which the quality of meat is not guaranteed - usually freshness or meat origin. At that time, the majority (>90%) of restaurant owners choose to buy in other stores, the main reason is that the particular meat is needed for their dishes and it cannot be replaced by other types. Few restaurant owners still choose to buy in less volume. Although price is not a priority factor in supplier selection, it has a certain influence on the buying behaviours of restaurant owners. If the price is cheaper than usual, they almost never buy more; but if the price is more expensive than usual, some of the restaurant owners

will switch to a cheaper alternative (nearly 17% of respondents) to ensure that the price of food does not increase because they tend to not increase the selling price in the context of competition (FGDs). Generally, prices often rise on festive occasions and at high tourist times (Dien Bien city).

Generally, the owners of restaurants and eateries prefer to use local beef (yellow cattle) because they think that the quality of meat is better (sweet, fragrant, less fat, firmer) than hybrid beef (Sindian hybrid, other hybrids). Especially in the processing of dishes such as dry beef, hybrid beef is usually drier and less tasty than the local beef market (FGD). In addition, some local dishes such as wintry strictly require good quality of beef offal. So, the owners of restaurants and eateries are very careful in the choice of beef for the dishes, especially local dishes.

Table 6. Ability to differentiate beef slaughtered from different breeds.

Item	Casual dining (n=48)	Restaurant (n=12)	Average (n=60)
Can differentiate (%)	37.50	33.33	36.67
Cannot differentiate (%)	62.50	66.67	63.33
Percentage of the respondents preferring local beef over imported beef (%)	58.33	58.33	58.33

Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

Despite this, over 50% of restaurant and diner owners said that they cannot distinguish beef by breed origin (Table 6). Besides, with the increase in the use of Korean-style dishes, restaurant and diner owners also use imported beef for processing new dishes. Therefore, not all restaurant and diner owners prefer to use local beef over imported beef. An in-depth interview with a hot pot owner showed that the amount of meat used is mainly imported Australian beef and usually import 2 weights/month from a food company (because supermarkets are more expensive), and used a meat slicer at home. The advantage of the beef is its stickiness, softness, and freshness compared to the local beef; and although more expensive, the restaurant still uses it because it fits their dishes.

3.4. Processing and preservation behaviour

Nearly half of restaurants use fresh beef immediately after buying, mainly for noodles and rice vermicelli cooked for breakfast. In addition, rice shops and restaurants also immediately perform preliminary processing such as marinating to use in

dishes for lunch and dinner customers. The rest is placed in the refrigerator and used always during the same day. The average storage time in the refrigerator is 4-7 h (Table 7).

Table 7. Practice processing and preserving beef at restaurants and casual dining.

Item	Casual dining (n=48)	Restaurant (n=12)	Average (n=60)	P-value
Cook immediately (%)	47.92	25.00	43.33	0.152 ^{NS}
Store in fridge (%)	52.08	75.00	56.67	
Storing time length (hours)	4.46	6.67	4.90	0.179 ^{NS}

Note: NS is not significant at 10% probability level. T-test for average numbers and Chi-square test for relative numbers. Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

Dishes made from beef: dishes made from the beef of other restaurants and eateries in Dien Bien are rich (Table 8).

Beef corn is mostly used in stir-fried dishes due to the characteristics of beef raised in the province with a low proportion of interlaced fat. Meanwhile, tenderloin is mainly used for noodle dishes and pho for breakfast. Beef belly is only processed mainly for a wine sauce.

Table 8. Beef dishes of restaurants and casual dining (%).

Processing	Casual dining (n=48)	Restaurant (n=12)	Average (n=60)
<i>Corn</i>			
Pho/noodle	27.27	14.29	25.00
Fry	36.36	42.86	37.50
Fry and hotpot	9.09	28.57	12.50
Other (grilled, steam, boil)	27.27	14.29	25.00
<i>Loin</i>			
Pho/noodle	34.78	60.00	39.29
Fry	26.09	0.00	21.43
Hotpot	4.35	0.00	3.57
Fry and hotpot	8.70	0.00	7.14
Other (grilled, steam, boil)	26.09	40.00	28.57
<i>Bacon</i>			
Fry	16.67	0.00	14.29
Stewed	66.67	100.00	71.43
Other	16.67	0.00	14.29

Source: Results of the survey on beef consumption in Dien Bien province under the project "Intensification of beef cattle production in upland cropping systems in Northwest Vietnam", 2019.

3.5. Some problems for restaurants and food stores in the beef value chain and implications for solutions

In general, restaurants and eateries do not have much difficulty in buying meat materials. The beef supplied to Dien Bien Phu city is provided by the slaughterhouses in the city and the slaughterhouses in the surrounding districts such as Dien Bien district and the beef supplied to Tuan Giao district is from the slaughterhouse in the district. In the town of Tuan Giao, sometimes restaurants and eateries do not buy the desired amount of meat because of the small slaughter scale. In terms of quality, the majority of restaurant owners are satisfied with the current quality of beef, mainly in terms of freshness and cooking quality. The price factor is often mentioned, as restaurant and diner owners claim that the current price of beef is too high, causing the cost to rise and consumers to reduce their demand.

4. Discussion

With a relatively large volume of purchases, casual dining and restaurants are important actors of the beef value chain in Dien Bien province. G.D. Yadata, et al. (2020) [11] indicated that restaurants and eateries consume about 50% of the total beef in the beef value chain in Ethiopia. Those eateries and restaurants also sell raw beef to households. This means that they perform retailing functions and sometimes they also slaughter cattle as well. D. Yuzaria, et al. (2020) [12] also reported that restaurants are one of the three most profitable actors in the beef food chain in Indonesia. In America, restaurants in the beef industry usually are in the group of hamburger or/and fast-food restaurants. Some big brand names are McDonald's, Burger King, and Yum! Brands. It is estimated that about 35 percent of beef consumption by households are eaten at restaurants [13].

Food safety seems to be of less concern among the criteria for selecting suppliers as well as choosing meat, as restaurant owners are more interested in the cooking quality of dishes, although the freshness and smell of beef can also give some information about food safety. In Bangladesh, restaurants typically buy beef only from wholesalers and retailers. Moreover, the important criteria for choosing beef are the quality, size, weight of the carcass, and food safety [14]. B. Novakovic' (2014) [1] also points out that large restaurants and hotels often have specific standards

for beef quality and product packaging. On the other hand, restaurant owners in Dien Bien province do not pay attention to packaging because fresh meat is not packaged, and they prefer to examine raw meat by smelling and touching it (preferably if the meat is still warm and even convulsive). However, as income improves and consumer awareness is increases, food safety will be an issue of concern [15, 16].

Regarding the origin of beef and breed of cattle, customers of restaurants almost never ask about the origin of beef and the breed of cattle, yet restaurant owners prefer indigenous and locally raised cattle. In the UK, the total revenue of restaurants in a year is around £5.4 billion. For example, the customers of the largest steakhouse chain with 250 restaurants nationwide are also less interested in beef origin because they place their trust in quality [17], and they think that quality is closely related to origin [18]. Some other studies show that restaurant owners are willing to pay more for locally produced beef [19, 20]. Even with imported beef, N.N. Mai, et al. (2022) [21] also showed that consumers buying imported beef are interested in information and packaging of product origin. Thus, consolidating the supply of local beef cattle with more reasonable prices, and building linkages from households to slaughterhouses and restaurants to be able to meet quality and traceability, contributes to ensuring food safety.

Dietary change in dining out behaviour using meat-based foods has increased in Vietnam in recent years [22]. In addition, the introduction of outside culinary styles such as Korean and Japanese hot pot dishes also increases the demand for foreign beef. The characteristic of beef prepared in this style is that it is usually tender, with or without fat, and usually does not become tough when cooked for a longer time than local beef. In Vietnam, some foreign beef breeds with quality meat such as imported beef like wagyu or Australian beef can also be researched and developed in order to diversify products and compete with imported meat.

5. Conclusions

Casual dining and restaurants play an important role in the meat value chain in general and the beef value chain in particular. The research results show that in Dien Bien, casual dining and

restaurants are the actors in purchasing fresh beef and creating added value through processing and serving customers. Beef is one of the three main types of meat used in casual dining and restaurants including beef produced locally and imported beef (frozen beef). They often purchase fresh beef daily from slaughterhouses, wholesalers, and retailers and they usually have several suppliers. The relationship with the seller is the most important criterion in the selection of meat suppliers for restaurants and casual dining because it is often built on trust in quantity, quality, and price. The criteria in the beef selection are freshness, stickiness, meat colour, and sometimes the smell of fresh meat. In general, restaurant owners prefer to use local beef over buying elsewhere as they consider the quality of local beef more suitable for preparing dishes. Restaurants use most types of beef for their menus, but most commonly ones are corn, belly, and loin. In general, restaurants do not face many difficulties in sourcing meat, but sometimes they cannot buy the desired amount of meat and are afraid of the receiving buffalo meat instead of beef; as well as want to buy local beef but cannot distinguish between local and other beef. The high price of fresh beef is a problem for them as it increases the cost of doing business and reduces competition. In addition, the trend of changing culinary styles with dishes made from imported beef brings both opportunities and challenges for cattle farmers in Dien Bien province. Solutions to upgrade the beef value chain in Dien Bien include developing the local supply of beef with lower prices and higher quality, building linkages among value chain actors to ensure quality and gradual traceability, and implementing research on cattle breeds with more diverse meat quality attributes for changing culinary needs.

CRedit author statement

Bui Van Quang: Writing - Original draft preparation, Data curation and Editing; Nguyen Thi Duong Nga: Conceptualisation, Methodology, Writing - Reviewing; Pham Van Hung: Reviewing and Editing; Duong Nam Ha: Reviewing and Editing; Tran The Cuong: Investigation; Han Anh Tuan: Investigation; Le Thi Thanh Huyen: Investigation; Stephen Ives: Reviewing and Commenting.

COMPETING INTERESTS

The authors declare that there is no conflict of interest regarding the publication of this article.

REFERENCES

- [1] B. Novakovic¹ (2014), *Analysis of Value Chain for Meat and Meat Products*. Enterprise Development Agency Eda, Banjaluca Publisher, 53pp.
- [2] M. Ijaz, M.K. Yar, I.H. Badar, et al. (2021), "Meat production and supply chain under COVID-19 scenario: Current trends and future prospects", *Frontiers in Veterinary Science*, **8**, DOI: 10.3389/fvets.2021.660736.
- [3] G. Gereffi, J. Lee (2009), "A global value chain approach to food safety and quality standards", *Global Health Diplomacy for Chronic Disease Prevention Working Paper Series*, 51pp.
- [4] J. Dzanja, P. Kapondamgaga, H. Tchale (2013), "Value chain analysis of beef in central and southern Malawi (Case studies of Lilongwe and Chikhwawa districts)", *International Journal of Business and Social Science*, **4(6)**, pp.92-102.
- [5] U.S. Agency for International Development (2018), "Assessment of livestock value chain/market systems", *Final Report*, https://pdf.usaid.gov/pdf_docs/PA00TQ9T.pdf, accessed 25 October 2022.
- [6] Safefood (2008), "A review of the beef food chain", *Summary Document*, 17pp, [https://www.safefood.net/getmedia/abd4d38b-579f-49c7-8d1b-48067cb7cae8/Safefood_8202_A5_Beef_Summary-20\(2\).aspx?ext=.pdf](https://www.safefood.net/getmedia/abd4d38b-579f-49c7-8d1b-48067cb7cae8/Safefood_8202_A5_Beef_Summary-20(2).aspx?ext=.pdf), accessed 25 October 2022.
- [7] General Statistics Office of Vietnam (2023), *Statistics on Beef Cattle Population by Provinces* (in Vietnamese).
- [8] S. Ives, V.C. Cuong, P. Lane, et al. (2018), "Overcoming technical and market constraints to the emergence of profitable beef enterprises in the north-western highlands of Vietnam", *Final Report*, Australian Centre for International Agricultural Research, Canberra, 73pp.
- [9] B.V. Quang, N.T.D. Nga (2020), "Studies on the beef value chain in Tuan Giao district, Dien Bien province", *Vietnam J. Agri. Sci.*, **18(1)**, pp.73-80 (in Vietnamese).
- [10] I. Etikan, S.A. Musa, R.S. Alkassim (2016), "Comparison of convenience sampling and purposive sampling", *American Journal of Theoretical and Applied Statistics*, **5(1)**, pp.1-4, DOI: 10.11648/j.ajtas.20160501.11.
- [11] G.D. Yadata, A. Gemechu, A. Mitiku (2020), "Beef cattle value chain map in Nono Benja distirict, Jimma zone, Oromia regional state, Ethiopia", *Journal of Biology, Agriculture and Healthcare*, **10(11)**, pp.1-13, DOI: 10.7176/JBAH/10-11-01.
- [12] D. Yuzaria, B. Basyar¹, R. Khairati (2020), "The analysis of value chain of beef cattle partnership business based on financial technology", *American Journal of Animal and Veterinary Sciences*, **15(1)**, pp.48-58, DOI: 10.3844/ajavsp.2020.48.58.
- [13] M. Lowe, G. Gereffi (2009), "A value chain analysis of the U.S. beef and dairy industries", *Report Prepared for Environmental Defense Fund*, 55pp.
- [14] M.G. Kok, J.M. Soethoudt, D.M. Vernooij, et al. (2021), "Analysis of the beef value chain in Bangladesh", *Towards a Strategic Action Agenda for The Dhaka City Corporations, Wageningen Food and Biobased Research*, 49pp, <https://edepot.wur.nl/557278>, accessed 25 October 2022.
- [15] L.D.A. Zanetta, R.M.D. Mucinhato, M.P. Hakim, et al. (2022), "What motivates consumer food safety perceptions and beliefs? A scoping review in BRICS countries", *Foods*, **11(3)**, DOI: 10.3390/foods11030432.
- [16] E. Zhllima, D. Imami, M. Canavari (2015), "Consumer perceptions of food safety risk: Evidence from a segmentation study in Albania", *Journal of Integrative Agriculture*, **14(6)**, pp.1142-1152, DOI: 10.1016/S2095-3119(14)60997-7.
- [17] M. Francis, D. Simons, M. Bourlakis (2008), "Value chain analysis in the UK beef foodservice sector", *Supply Chain Management*, **13(1)**, pp.83-91, DOI: 10.1108/13598540810850346.
- [18] K.A. Varnold, C.R. Calkins, B.L. Gordon, et al. (2011), "Importance of steak origin to restaurant customers", <https://beef.unl.edu/b11eefdf-8342-4eda-8290-7e873ffc5d7c.pdf>, accessed 6 December 2022.
- [19] L.C. McKay, K.L. DeLong, K.L. Jensen, et al. (2019), "Estimating restaurant willingness to pay for local beef", *Agribusiness*, **35**, pp.610-624, DOI: 10.1002/agr.21605.
- [20] A. Sharma, J. Moon, C. Strohbehne (2014), "Restaurant's decision to purchase local foods: Influence of value chain activities", *International Journal of Hospitality Management*, **39**, pp.130-143, DOI: 10.1016/j.ijhm.2014.01.009.
- [21] N.N. Mai, D.Q. Giam, D.V. Vien (2022), "Factors influencing imported beef purchase intention: A case study in Long Bien district, Hanoi, Vietnam", *Vietnam Journal of Agricultural Sciences*, **5(1)**, pp.1408-1423, DOI: 10.31817/vjas.2022.5.1.08.
- [22] J. Harris, P.H. Nguyen, L.M. Tran (2020), "Nutrition transition in Vietnam: Changing food supply, food prices, household expenditure, diet and nutrition outcomes", *Food Sec.*, **12**, pp.1141-1155, DOI: 10.1007/s12571-020-01096-x.