



Compliance with Laws and Slaughterhouse Standards of Butcher's Shops in North-Eastern Thailand

A. Muangsean^{a,*,*} & W. Aengwanich^{b,*,*}

^aFaculty of Law, Mahasarakham University

Kham Riang Sub-district, Kantharawichai District, Mahasarakham 44150, Thailand

^bFaculty of Veterinary Sciences, Mahasarakham University

Muang District, Mahasarakham 44000, Thailand

*A. Muangsean and W. Aengwanich contributed equally to this work

*Corresponding authors: tanlaws@hotmail.com; worapol.a@msu.ac.th

(Received 02-08-2022; Revised 28-10-2022; Accepted 16-11-2022)

ABSTRACT

The objective of this research is to study the characteristics of slaughterhouses and meat distribution of butcher's shops operating under the relevant laws, including attitudes, problems, and obstacles facing butchers in implementing the law in the north-eastern part of Thailand. A total of 14 butcher shops at Baan Din Dam, Muang District, Maha Sarakham Province, participated in the study. Data were collected by surveying, interviews by using a semi-structured questionnaire, and focus group discussion. It was found that in cases where animals are slaughtered in standard slaughterhouses, butchers complied with the law. On the other hand, in the case of butchers who slaughtered animals by themselves, it was found that the practice mostly did not meet the standards as required by law. In terms of problems, obstacles, and attitudes of butchers regarding legal compliance, it was found that the butchers have knowledge related to law at a moderate level. They considered that the law was difficult to follow, but there was also a positive opinion that complying with the law gives consumers confidence and safety. Education level is the factor affecting opinions and attitudes on slaughter and meat distribution law. Compliance with butchers' slaughter and meat distribution laws in north-eastern part of Thailand requires supervision from the government, and ongoing provision of education is necessary.

Keywords: attitude; butcher; knowledge; law; slaughterhouse

INTRODUCTION

Foodborne illnesses have caused significant morbidity and mortality worldwide, particularly in developing countries, and are considerable obstacles to socioeconomic development worldwide (Bahir *et al.*, 2022). Approximately 75% of new human infectious diseases are caused by pathogens of animal origin and may occur at any stage in the process from food production to consumption (Leotta *et al.*, 2016). Meat contamination in abattoirs and retail meat outlets results from the use of contaminated water, unhygienic practices like poor handling, the use of contaminated tables to display meat intended for sale, and the use of contaminated knives and other equipment in cutting operations are sources of bacterial contamination (Bersisa *et al.*, 2019). Besides, meat handlers such as butchers working in slaughterhouses are not only the main vectors of meat contamination but can also be an asymptomatic reservoir of foodborne microorganisms (Bahir *et al.*, 2022). Aalabbody (2021) reported that in a typical slaughterhouse, carcasses are slaughtered, prepared, stored, and classified under safe conditions and in a sanitary environment. This is not so for illegal slaughtering, which is unacceptable and dangerous to public health.

Generally, slaughterhouses are a place for slaughter and control of the livestock production chain. Therefore, slaughterhouses should provide adequate facilities that sustain high-quality hygienic conditions (Okpala *et al.*, 2021). As the population increases, slaughterhouse demand increases (Ajmal & Jamal, 2019). In Thailand, there is a control approach for food product standards throughout the production chain before it reaches the consumer (Tancharoensukjit, 2015). The important law that relates to the slaughter and meat distribution in Thailand is the Control of Animal Slaughter and the Distribution of Meat Act, B.E. 2559 (Traimongkolkul, 2016), which is a law that focuses on the safety and hygiene of consumers and which prioritizes the source of the animal. It also includes requirements for comprehensive inspections at different stages of meat production. The slaughter process in a standard slaughterhouse, passes the disease examination process both before and after slaughtering, including certification of meat sold to consumers. This guarantees that the meat is disease-free and safe for consumption (Chalorsuntisakul, 2018).

There are also the Ministerial Regulations of Agriculture and Cooperatives about the rules and procedures, and conditions for setting up slaughterhouses

and animal shelters is the Ministerial Regulation on Determination of Criteria, Procedures, and Conditions for Establishing Slaughterhouses, Lairage, and Animal Slaughter, B.E. 2555 (Chotinun *et al.*, 2014). In addition to asking permission to build the correct slaughterhouses and animal shelters, operators must meet the standards prescribed by the Ministerial Regulation. However, despite the laws and regulations on slaughterhouse standards and slaughter procedures for consumption, there are still some problems in regulating slaughterhouse standards and slaughtering processes for consumption, especially regarding the law's implementation (Tancharoensukjit, 2015).

However, information about the slaughter and meat distribution operation in line with each country's law is limited, especially as to the problems, obstacles, and attitudes about slaughterhouses and their compliance with related laws. Therefore, it is important to know the current situation of law enforcement related to slaughtering and meat distribution in each country to guide the enforcement of the correct and appropriate law. Thus, the objectives of this research are 1) To study the characteristics of slaughterhouses and meat distribution of butcher shops operating under the relevant laws and 2) To study general information, attitudes, problems, and obstacles to butchers influencing the implementation of the law in the north-eastern part of Thailand. This will acquire knowledge, information, and guidelines to encourage entrepreneurs to carry out legal slaughtering and meat distribution and will result in consumers receiving quality and safe meat. In addition, the information obtained from this study may be useful to the government in formulating efficient and effective slaughterhouse policies and/or actions in the future.

METHODS

Ethical Approval

The study was reviewed and approved by the Human Research Ethics Committee of Mahasarakham University. The license number was 072-072/2565. Informed consent was orally obtained from all butchers who participated in this study. In addition, the butchers' participation in this study was voluntary.

Schematic Overview of This Study

This research, conducted between January and June 2022, focuses on the concept of slaughterhouse standards, legal compliance, problems, obstacles, and attitudes of butchers in Maha Sarakham Province, north-eastern part of Thailand. It was performed to provide information about cognition in terms of the practices related to the operation of the slaughterhouse and compliance with pre- and post-slaughter control standards, including problems and obstacles as well as difficulties in the implementation of the slaughterhouse standards of butchers.

Research Site and Target Population

This research was conducted in Maha Sarakham Province in the north-eastern part of Thailand, which is approximately 406 km from Bangkok at 16°11'5.39"N, 103°18'2.41"E. Maha Sarakham Province has a total population of 948,310 people. In Maha Sarakham Province area, a total of 27 registered butchers. A group of butchers located at Baan Din Dam, Mueang District, Maha Sarakham Province was selected. They were part of a large cluster of slaughterhouses. They sold meat both on-site and distributed it to many areas of Maha Sarakham Province and also to nearby provinces as this group of butchers is located next to the main transport routes.

Development of Research Instrument

The tools for data collection of this research were semi-structured questionnaires because the semi-structured questionnaires can be used conveniently by both the interviewer and the interviewee. Due to the interviewees sometimes being too busy to complete the questionnaire, the questionnaire was developed from a literature review on the Control of Animal Slaughter and the Distribution of Meat Act, B.E. 2559, and the Ministerial Regulation on Determination of Criteria, Procedures, and Conditions for Establishing Slaughterhouses, Lairage, and Animal Slaughter B.E. 2555 that are currently in force. After the questionnaire had been drafted, the questionnaires were used to determine the Index of Item Object Congruence (IOC) for each question. Then, the questions with IOC values greater than 0.5 were used as questionnaires. The questionnaire was then sent to 3 experts to verify the content and consistency of the research project. Then a reliability test of the questionnaire was performed by trying it out with a non-sample population of 30 people. The survey results were used to determine confidence coefficient according to the Cronbach's alpha coefficient method. The confidence value of the whole questionnaire was 0.94.

Collecting Data

Assessment of abattoir facilities and operation. Investigation of the slaughterhouse was performed in the target group by surveying and collecting data, i.e., slaughterhouse management, the processes in the slaughterhouse, and meat inspection before selling. The place of business, animal shelter, slaughterhouse, facilities, and meat outlets in the research area were visited. Empirical data collection was performed along with taking pictures with a digital camera.

Questionnaire content and interview process. The questionnaire used in the interview consisted of 5 parts consists of demographic questions, the experience of slaughtering, questions of knowledge, and obstacles. Interviews were conducted between March and May 2022 during the slaughterhouse data collection, such as slaughterhouse management, slaughter process, and meat inspection before selling. For sample group

selection, we used purposive sampling, that is, butcher shop owners, because they are directly involved in the slaughter and distribution of meat and must be carried out following the law, including being responsible for not complying with the law. Interviews were held with 14 butchers, the total number of butchers in the research area (at Baan Din Dam). The researcher requested permission from the interviewees, explained in detail about the questions before conducting the interview, and had to obtain prior consent for interviews from butchers.

Focus group discussion. The focus group discussion activity was conducted by the research team. The target group was defined as 10 stakeholders, including butchers, local government officials, and law enforcement officials. The activities were composed of talking and exchanging problems, obstacles, and attitudes about the practice of slaughter and meat distribution law compliance, slaughtering, and meat inspection using the information collected from the questionnaire. The focus group discussion was conducted to make the data collected from the questionnaire clear in terms of problems, obstacles, and attitudes about the practice of slaughter and meat distribution law compliance.

Data processing and analysis. When the interview was completed, the data were analyzed by dividing the rating scale, and the score value was interpreted. The details are shown in Table 1. Quantitative data are expressed in percentage and mean ± SD. The qualitative data obtained were sorted and interpreted in relation to the research objectives to provide general interpretations of the findings and show how thematic areas and issues are interrelated.

RESULTS

Assessment of Slaughterhouse Facilities and Operations

A slaughterhouse where butchers bring cattle to slaughter is a standard municipal slaughterhouse that is away from the butcher group for about 15 km. For the municipal slaughterhouse, it was done by municipal staff trained. The slaughterhouse section includes the animal shelter and slaughterhouses as well as the drainage system. This municipal slaughterhouse was audited and approved by a related organization. When animals

arrived, they rested for 24 hours, then there would be an inspection of diseases and abnormalities before slaughtering. For procedures of slaughtering in the municipal slaughterhouse, there are steps as follows: Make the animal unconscious before killing using the stunt bolt gun before slaughtering or using ritual methods or religious regulations. After making the animal unconscious, they will quickly hang the hind legs of the cattle and lift it off the floor. Then, slaughter and allow the bleeding from the cattle to continue for about 5-6 minutes. The knife or equipment must be cleaned and disinfected before and after use. During slaughtering, the area that is contaminated with blood is periodically cleaned and cleaned up after this is done.

Before slaughtering, butchers go shopping for cattle at the cattle market. Then butchers will send the selected cattle to slaughter. Generally, a cow was slaughtered each day. If an animal was not sold, it was returned to sell the next day again, and if it did not sell out within 2 days, all the meat would be processed as dried.

Before slaughtering, butchers will provide details such as the number of cows to be slaughtered, animal source, date and time of slaughtering, and the name of the slaughterhouse to the local staff officers for slaughtering permits, which are most often officers or managers of the slaughterhouse of the local government organization. Also, a certificate of an animal source is required before entering the slaughterhouse. This certificate is issued by the authority, such as the provincial livestock or district livestock authority. In case the slaughterhouse does not open, butchers could choose to slaughter cows by themselves by requesting permission from the provincial governor on a case-by-case basis.

For slaughtering cattle outside the standard slaughterhouse, the following steps are required. The butcher will take the cattle from the cattle market and place them in a shelter near the slaughter site. There will be a place for cattle to rest and for operators to look for any abnormalities. Then a butcher will select cattle to slaughter. The slaughtering processes used the traditional slaughter method. Cattle will be slaughtered in a housing. However, in the housing, functional proportion was not divided and structured as with a standard slaughterhouse. Therefore, the slaughter processes do not meet all legal standards. Mostly, before the slaughtering of animals is done, officers perform health checks, but after the slaughter of animals, meat inspection is performed sometimes. Mostly, cows were transported

Table 1. The rating scale and categories based on the questionnaire score

Item of questionnaires	Number of questions	Score	Category based on score				
			Lowest	Low	Moderate	High	Highest
The level of knowledge and understanding about the slaughterhouse business practice guidelines.	12	Aggregate		1-4	5-8	9-12	
The level of knowledge and understanding of compliance with the standard in respect of pre- and post-slaughter control.	25	Aggregate		1-12	13-18	19-25	
Problems and obstacles as well as attitudes towards legal measures related to slaughterhouse standards.	10	Average (1-5)	1.00-1.49	1.50-2.49	2.50-3.49	3.50-4.49	4.50-5.00

using pick-up trucks or six-wheeled vehicles, which the butchers had specially arranged for the transport. In municipal standard slaughterhouses, the slayer will make the cow lose consciousness using a stun-bolt gun before slaughtering. However, butchers who slaughtered animals by themselves used a method of smashing the head instead of using a stun gun, but this method is illegal. Generally, the number of workers who slaughter cattle in the slaughterhouse will depend on the number of animals slaughtered. The slaughter of animals in the slaughterhouse can be carried out at any time.

The time for slaughtering animals in standard slaughterhouses will be set by the butcher and is usually before the time of meat sale. However, in the case of butchers who got permission to slaughter a cow by themselves, most cows were killed at night, which must be following the announcement of the Department of Livestock Development on Animal Disease Inspection and Identification Report Form B.E. 2562. In addition, one characteristic of meat distribution in the butcher group of Baan Din Dam, Muang District, Maha Sarakham Province is that in addition to selling meat (Figure 1), butchers will bring meat to prepare various dishes for sale along with selling meat, which adds value to their products.

Sociodemographic Characteristics, Problems, Obstacles, and Attitudes of Butchers

Data were collected by interview method using a questionnaire and involved (1) sociodemographic characteristics, (2) experience and training in legal matters related to slaughter and meat distribution, (3) level of knowledge and understanding of butchers related to slaughter and slaughterhouse practices in line with the law, (4) level of knowledge and understanding of legal matters related to pre- and post- slaughter practice, and (5) problems and obstacles as well as attitudes towards legal measures related to slaughterhouse standards of the butchers. The following results were found.

Most butchers were over 50 years old (50%), followed by 40-50 years old (28.57%). Only 1-2 butchers are between 20-40 years old. All had primary and secondary education (100%). Most were married and living together (71.44%), and a minority of butchers were separated (14.28%) or living together (14.28%). Most



Figure 1. Butcher shop at Baan Din Dam, Mueang District, Maha Sarakham Province, Thailand

butchers had an income of more than 30,000 baht/month (42.86%), followed by between 25,000-30,000 baht/month (28.58%), a minority of butchers had income <20,000 baht/month (14.28%), and between 20,000-25,000 baht/month (14.28%). The main source of income comes from the sale of meat and the sale of food made from meat, including beverages sold with food. All butchers had debt (100%) (Table 2).

Most butchers have been in this occupation for > 20 years (42.85%), followed by 10-20 years (28.57%), and < 5 years (21.43%). Only 1 had been in the business 5-10 years (7.15%). Most of the butchers had passed training or knowledge transfer related to compliance with slaughterhouse standards (85.71%). Only two cases (14.29%) had not received training (Table 3).

When measuring the knowledge and understanding of butchers related to slaughter and slaughterhouse practices in line with the law, it was found that most entrepreneurs had a moderate level of knowledge (5-8 points out of 12 points) (64.29%), followed by a low level of knowledge (1-4 points out of 12 points) (35.71%) (Table 4). When asked about the knowledge and understanding of legal matters related to pre- and post-slaughter practice of butchers, it was found that butchers were moderately literate (12-18 points out of 25 points) (57.14%), followed by a high level of comprehension (19-25 points out of 25 points) (42.86%) (Table 4).

According to the questionnaire on problems and obstacles, as well as attitudes towards legal measures

Table 2. Sociodemographic of butchers

Variables	Category	Percentage
Age (years)	20-29	14.28
	30-39	7.14
	40-49	28.57
	≥ 50	50.00
Formal education	Primary and secondary school	100
Marital status	Marriage	71.44
	Separation	14.28
	Living together	14.28
Income (000 THB)	< 20	14.28
	20 –25	14.28
	>25- 30	28.58
	>30	42.86
Debts	Yes	100

Note: THB= Thailand baht.

Table 3. Experience and training in legal matters related to slaughter and sale of meat by butchers

Variables	Category (years)	Percentage
Experience in slaughter	< 5	21.43
	6-10	7.15
	11-20	28.57
	>20	42.85
Training in slaughter and sale meat law	Yes	85.71
	No	14.29

Table 4. Level of knowledge of butchers related to slaughterhouses and pre- and post-slaughter practice of butchers

Knowledge related to slaughterhouses		Knowledge related to pre and post-slaughter	
Point	Percentage	Point	Percentage
9-12	0	19-25	42.86
5-8	64.29	12-18	57.14
1-4	35.71	1-11	0

related to slaughterhouse standards of butchers, it was found that butchers had an opinion on issues as follows, 1) the law is characterized by giving too much power to officials, 2) the law cannot be applied in practice as it will result in higher costs and adverse effects on operators and consumers, 3) if strictly following the law, consumers will truly benefit, 4) the law is more beneficial to large entrepreneurs than retailers, 5) the principles of law and what most entrepreneurs do are completely different, 6) if the state gives importance to issues and comes to help, it will bring more benefits to entrepreneurs, 7) focus should be on the income and survival of entrepreneurs rather than strictly enforcing the law, 8) if strictly following the law, this will result in consumers being more confident in product quality with high scores. While the level of opinion on the issue was 9) lack of giving proper knowledge and understanding of officials to entrepreneurs and 10) if the law is strictly followed, it will reduce the spread of unwanted pathogens. Overall, entrepreneurs gave high opinion scores about obstacles and problems with legal measures related to slaughterhouse standards (Table 5).

DISCUSSION

Butchering is an activity that has a long history since the start of domesticating animals and can be divided into primary or secondary steps. Primary butchering is the slaughter, evisceration, and selection of carcass sides or quarters from which primary cuts can be produced. Secondary butchering involves boning and

trimming primal cuts in preparation for sale (Asuming-Bediako *et al.*, 2018). Generally, a slaughterhouse is a premises approved and registered by the controlling authority for hygienic slaughtering and inspection of animals, processing, effective preservation, and storage of meat products for human consumption. These prerequisite programs include good manufacturing practices, good hygiene practices, and standard operating procedures (Annan-Prah *et al.*, 2012). The purpose of building an abattoir is to produce hygienically prepared meat from animals, using hygienic techniques for slaughtering and dressing (Bello *et al.*, 2015).

The Control of Animal Slaughter and the Distribution of Meat Act, B.E. 2559 and the Ministerial Regulation on Determination of Criteria, Procedures, and Conditions for Establishing Slaughterhouses, Lairage, and Animal Slaughter B.E. 2555 of Thailand specifies the procedures for asking for permission to slaughter and the process of inspection of meat quality. From this study, it was found that the butchers at Baan Din Dam, Muang District, Maha Sarakham Province, had taken actions as required by law, namely, they had a license to sell animal carcasses, slaughter notification forms had been followed, including a certificate of animal source before entering the slaughterhouse, and having a certificate to sell meat that passed the inspection from a meat inspector. However, in the case of requesting permission to slaughter animals outside the municipal slaughterhouse, after receiving permission from the provincial governor, it was found that animal slaughter was carried out by using a traditional slaughter method, but it was monitored by officers. The results are consistent with a study by Kumalic (2018), which examined EU Legislation on animal slaughter versus traditional home slaughter in Bosnia and Herzegovina. It was found that although the purpose of the EU law is to reduce the stress and suffering on animals and to ensure quality meat, by making the animal unconscious before slaughtering it by using a gun first, but Islamic principles did not allow the use of such a method. Therefore, there are practical differences between the practice of law and religious belief.

Table 5. Problems, obstacles, and attitudes towards legal measures related to slaughterhouse standards of butchers

Variables	<i>x</i>	SD	Category
Lack of giving proper knowledge and understanding of officials to entrepreneurs.	3.25	0.46	moderate
The law is characterized by giving too much power to officials.	4.16	0.99	high
The law cannot be applied in practice as it will result in higher costs and adverse effects on operators and consumers.	3.88	0.99	high
If strictly following the law, consumers will truly benefit.	4.00	0.76	high
If the law is strictly followed, it will reduce the spread of unwanted pathogens.	3.12	0.83	moderate
The law is more beneficial to large entrepreneurs than to retailers.	3.87	0.99	high
The principles of law and what most entrepreneurs do are completely different.	3.87	0.83	high
If the state gives importance to and comes to help, it will bring more benefits to entrepreneurs.	4.12	0.99	high
The focus should be on the income and survival of entrepreneurs rather than strictly enforcing the law.	4.25	1.03	high
If strictly following the law, this will result in consumers being more confident in product quality.	3.66	0.52	high
Average	3.82	0.84	high

Note: *x*= mean; SD=standard deviation.

In addition, most of the available slaughterhouses in Thailand are standard. The owners were a few large private companies with a high investment budget. But for small butcher entrepreneurs in the local area, without support from the government seriously, the opportunity to improve animal product safety would be difficult. Therefore, in the future, local government needs to play a role in developing infrastructure, especially in relation to slaughterhouses, as well as tools and various supporting equipment suitable for small butchers.

From the data collection by interview method, it was found that most butchers have been engaged in the local meat trading business for a long time (10-20 years), although some have just started their operations. But in this study, both the Control of Animal Slaughter and the Distribution of Meat Act, B.E. 2559 and the Ministerial Regulation on Determination of Criteria, Procedures, and Conditions for Establishing Slaughterhouses, Lairage and Animal Slaughter, B.E. 2555 were considered. They were only announced 6 and 10 years ago, which means these butchers had a career selling meat before the law was promulgated when butchers slaughtered the animal by themselves after permission. Making the animal unconscious before slaughtering is still the traditional method that was done before the law came into force, and this is the local culture. This study's results are similar and different from the study by Lawan *et al.* (2013), in which the similarity was slaughter outside standard slaughterhouses. Facilities and locations may not be as good as those in a standard government slaughterhouse, but the difference is that there are officials to monitor.

From the study of the income of butchers, it was found that selling meat generates good income for entrepreneurs. The main source of income comes from the sale of meat. There is also revenue from the profits generated from the sale of food which is made from meat each day, including beverages sold with food. The income of these butchers was found to be quite high when compared to the income of the general public.

Therefore, there is an incentive for butchers to continue this occupation. In addition, the trade characteristics of butchers at Baan Din Dam, Muang District, Maha Sarakham Province were also found. There is a special feature. Butchers are either selling meat only or cooking and selling food along with selling meat. This makes the butcher's income quite high. Therefore, officials related to law enforcement may be considered to use the information about the income of butchers to drive them to build their own or group's slaughterhouse standard. Although this study found that all butchers were in debt, but the butcher's monthly income was high. Therefore, the excuse about the investment that requires a budget and lack of budget for building a standard slaughterhouse may not be a fact.

A study of the legal knowledge of butchers showed that they have a moderate level of knowledge of the laws on slaughter request permit procedures and operations before and after slaughter. Some butchers had knowledge at a low level. This is because all butchers only have education at the primary or secondary level. This low level of education of butchers may affect per-

ceptions in various fields. The findings are consistent with a study by Afnabi *et al.* (2014) that showed that low levels of education had an impact on perceptions of basic health knowledge among slaughter workers. According to this study, the butcher's level of education at Baan Din Dam, Muang District, Maha Sarakham Province, may be a factor that may lead to the decreased understanding of the law. Therefore, there is a need for officials to provide continuous education. This will increase understanding of the details of the law. There should be arrangements for butchers to have frequent meetings with officials. However, a study by Matchawe *et al.* (2019) showed that education was negatively correlated with the level of knowledge of those operating in slaughterhouses. In other words, the level of education did not affect the level of food safety knowledge of the slaughterhouse workers. This is similar to countries such as Ghana, Iraq, Trinidad, and Tobago.

When considering the problem and obstacle as well as attitudes by butchers towards legal measures relating to slaughterhouse standards, we can classify them into two groups, i.e., negative and positive attitudes. The negative attitudes towards law enforcement were 1) the law is characterized by giving too much power to officials, 2) the law cannot be applied in practice as it will result in higher costs and adverse effects on operators and consumers, 3) if strictly following the law, consumers will truly benefit, 4) the law is more beneficial to large entrepreneurs than retailers, 5) the principles of law and what most entrepreneurs do are completely different, 6) if the state gives importance to and comes to help, it will bring more benefits to entrepreneurs and, 7) there should be a focus on the income and survival of entrepreneurs rather than strictly enforcing the law.

From the comments on the negative attitude of butchers above, it is found that most butchers do not agree with the law they have to follow and understand that compliance with the law requires a high investment budget in animal shelters and slaughterhouses facilities in the slaughterhouse. Therefore, retail butcher shops are difficult to operate compared to large entrepreneurs. This is consistent with the study by Bahir *et al.* (2022), who reported that cost affects standard slaughterhouse compliance. As a result, butchers may not be able to comply with all applicable laws, and some legal rules are difficult to follow. One interesting comment was that the law and practice are different. In this regard, those involved, especially government officials, need to listen to the butchers and find ways for the butchers to understand and comply with the law.

The opinions and positive attitudes of butchers included 1) lack of giving proper knowledge and understanding of officials to entrepreneurs, 2) if the law is strictly followed, it will reduce the spread of unwanted pathogens, and 3) if strictly following the law, this will result in consumers being more confident in product quality. It was found that butchers, even if they did not agree with the law related to the control of animal slaughter and meat distribution, did understand the importance of the law, which could build consumer confidence. This opinion is consistent with a study by Okpala *et al.* (2021), who showed butchers agreed

that meat quality inspection is important and keeps consumers safe. However, butchers at Baan Din Dam, Muang District, Maha Sarakham Province, still need government assistance with regulatory and regulatory measures, which may include knowledge and understanding of proper sanitation practices in slaughterhouses. The results of this study are consistent with studies by Waldman *et al.* (2020) and Bahir *et al.* (2022), which studied knowledge, attitudes, and practices about slaughterhouses. They found that people working in slaughterhouses had a low level of understanding, especially regarding cleanliness and hygiene and making meat safe from pathogens. From the present study, the butchers understand that the law is difficult to follow but still understand the beneficial effects of the correct slaughter operation. From the focus group discussion, it was found that every year, there is a continuous training program to educate butchers as well as having a meeting between the officials, those responsible, whether it be livestock officials, police officers, and sub-district administrative organization staff to find a common solution, and there is legal action against a butcher who is non-compliance with the law. Therefore, it is the duty of those involved to understand, solve problems, and find acceptable solutions to both butchers and regulators.

The other two attitudes that the butchers gave their opinions on and had a moderate attitude level were lack of proper knowledge and understanding of entrepreneurs. By strictly following the law, will reduce the spread of unwanted pathogens. Both of these issues are related to details of knowledge of sanitation. This is consistent with the level of knowledge and understanding of the control of animal slaughter and meat distribution.

From this research, we found that there is much useful information that can be used as policy recommendations to relevant agencies as follows: There should be ongoing spread of knowledge and understanding to butchers. There should be regular joint activities among the officials involved with butchers, and the creation of cooperation between the government and the butchers to build standard slaughterhouses at an acceptable level in each group of butchers to comply with the legal framework, etc.

CONCLUSION

It was found that butchers in the study area complied with the laws and slaughterhouse standards for butcher's shops in cases where animals are slaughtered in standard slaughterhouses. However, regarding control of Animal Slaughter and the Meat Distribution act B.E., 2559, this also allows butchers to slaughter animals by themselves. Still, they must request permission on a case-by-case basis, and it was found that most of the practice did not meet the standards as required by law. In terms of problems, obstacles and attitudes of butchers regarding legal compliance, it was found that they had knowledge of the laws at a moderate level. The factor affecting opinions and attitudes towards the law on slaughter and the sale of meat is education level.

CONFLICT OF INTEREST

We certify that there is no conflict of interest with any financial, personal, or other relationships with other people or organizations related to the material discussed in the manuscript.

ACKNOWLEDGEMENT

This research project was financially supported by the Faculty of Law, Mahasarakham University, Thailand, and grant number 002/2564.

REFERENCES

- Aalabbody, H. H. K.** 2021. A comparative study of the consumers attitude on the meat hygiene slaughtered in and outside the slaughterhouse. *Iraqi Journal Market Research Consumer Protection* 13:77-84. [https://doi.org/10.28936/jmracpc13.1.2021.\(8\)](https://doi.org/10.28936/jmracpc13.1.2021.(8))
- Afnabi, R. K., R. P. Nameni, S. S. Kamdem, V. N. Ngwa, & J. J. E. Ngang.** 2014. Typology of the Cameroon traditional slaughterhouses based on hygiene practices. *Adv. Anim. Vet. Sci.* 2:477-487. <https://doi.org/10.14737/journal.aavs/2014/2.8.477.487>
- Ajmal, U. & S. Jamal.** 2019. Analyzing land-use land-cover change and future urban growth with respect to the location of slaughterhouses in Aligarh city outskirts. *Environmental Challenges* 5:100331. <https://doi.org/10.1016/j.envc.2021.100331>
- Annan-Prah, A., A. A. Mensah, S. Y. Akorli, P. T. Asare, & I. D. Kumi-Dei.** 2012. Slaughterhouses, animal slaughter and slaughter hygiene in Ghana. *J. Anim. Vet. Adv.* 2:189-198.
- Asuming-Bediako, N., S. Aikins-Wilson, S. Affedzie-Obresi, & E. K. Adu.** 2018. Challenges in the butchery industry: Potential opportunities for business in Ghana. *Ghana Journal Agricultural Science* 52:121-129.
- Bahir, M. A., I. Errachidi, M. Hemlali, B. Sarhane, A. Tantane, A. Mohammed, B. Belkadi, & A. Filali-Maltouf.** 2022. Knowledge, attitude, and practices (KAP) regarding meat safety and sanitation among carcass handlers operating and assessment of bacteriological quality of meat contact surfaces at the Marrakech slaughterhouse, Morocco. *Int. J. Food Sci.* <https://doi.org/10.1155/2022/4881494>
- Bello, M., M. K. Lawan, T. Aluwong, & M. Sanusi.** 2015. Management of slaughter houses in northern Nigeria and the safety of meat produced for human consumption. *Food Control* 49:34-39. <https://doi.org/10.1016/j.foodcont.2013.09.007>
- Bersisa, A., D. Tulu, & C. Negera.** 2019. Investigation of bacteriological quality of meat from abattoir and butcher shops in Bishoftu, central Ethiopia. *Int. J. Microbiol.* <https://doi.org/10.1155/2019/6416803>
- Chalorsuntisakul, S.** 2018. Legal Problems Relating to the Law on Animal Slaughtering for Selling Meat. Thesis of the Master of Law. Sukhothai Thammathirat University; Bangkok.
- Chotinun, S., S. Rojanasthien, F. Unger, M. Suwan, P. Tadee, & P. Patchanee.** 2014. An integrative approach to enhancing small-scale poultry slaughterhouses by addressing regulations and food safety in northern-Thailand. *Infect. Dis. Poverty* 3:46. <https://doi.org/10.1186/2049-9957-3-46>
- Kumalic, S.** 2018. Traditional home slaughtering of animals in the framework of EU legislation. Evidence from Bosnia and Herzegovina. *Comparative Southeast European Studies* 66:532-553. <https://doi.org/10.1515/soeu-2018-0040>
- Lawan, M. K., M. Bello, J. K. P. Kwaga, & M. A. Raji.** 2013. Evaluation of physical facilities and processing operations

- of major abattoirs in North-western states of Nigeria. *Sokoto Journal Veterinary Sciences* 11:56-61. <https://doi.org/10.4314/sokjvs.v11i1.9>
- Leotta, G. A., V. Brusa, L. Galli, C. Adriani, L. Linares, A. Etcheverría, M. Sanz, A. Sucari, P. P. Garcia, & M. Signorini.** 2016. Comprehensive evaluation and implementation of improvement actions in butcher shops. *PLoS ONE* 11:e0162635. <https://doi.org/10.1371/journal.pone.0162635>
- Matchawe, C., L. M. Ndip, A. Zuliani, J. J. T. Tsafack, B. J. Nsawir, E. Piasentier, & N. Joseph.** 2019. Knowledge, attitude and practices (KAP) regarding meat safety and sanitation among carcass handlers operating at the Yaoundé slaughterhouse, Cameroon. *International Journal Advanced Research and Publications* 3:150-155.
- Okpala, C. O. R., O. C. Nwobi, & M. Korzeniowska.** 2021. Towards delineating butchers' knowledge base, challenges encountered, and enhancement prospects of meat inspection processes: A cattle slaughterhouse case analysis. *Meat Sci.* 62:41-56. <https://doi.org/10.18485/meattech.2021.62.1.5>
- Tancharoensukjit, S.** 2015. Slaughterhouse Standard Control. Thesis of the Master of Law. Thammasat University, Bangkok.
- Traimongkolkul, O.** 2016. A Comparative Study of Legal Measures on Meat Safety in Thailand, the United States, and Singapore. Thesis of the Master of Law, Thammasat University, Bangkok.
- Waldman, L., T. A. Hrynicky, J. Benschop, S. Cleaveland, J. A. Crump, M. A. Davis, B. Mariki, B. T. Mmbaga, N. Mtui-Malamsha, G. Prinsen, J. Sharp, E. S. Swai, K. M. Thomas, & R. N. Zadoks.** 2020. Meat safety in northern Tanzania: Inspectors' and slaughter workers' risk perceptions and management. *Front. Vet. Sci.* 7:309. <https://doi.org/10.3389/fvets.2020.00309>