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## Marketing and costs of sand roasted groundnut production by three community enterprises in Kudjub District, Udon Thani Province, Thailand

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**Abstract** Three community enterprises in Kudjub District, Udon Thani Province: Nongno Community Enterprise, Nongkhong Community Enterprise, and Khamjaroen Community Enterprise are popular sand roasted groundnut producers. This popularity was resulted from their products' taste and standard of their production stages which were superb that the FDA and OTOP had ranked their products as high quality. This promoted revenue generation and effectiveness of the three community enterprises. Examining the marketing mix, similarity was found in their promotional efforts, but there were differences in products, prices and placement. The highest production cost of 9.67 baht/120 g was found in Nongkhong Community Enterprise. The costs of the other two groups: Nongno Community Enterprise and Khamjaroen Community Enterprise were 8.97 and 8.06 baht/120 g, respectively. Each community enterprise stated that the highest variable costs were from raw materials, and the highest fixed costs came from depreciation of production equipment and facilities. Khamjaroen Community Enterprise had the highest return of 7.93 baht/120 g, including Nongno Community Enterprise at 5.02 baht/120 g and Nongkhong Community Enterprise with 4.33 baht/120 g. In addition, comparison of the three community enterprises indicated that their costs and returns were significantly different at a statistical level of 0.05.

**Keywords:** Depreciation, Retail price, Wholesale price

### Introduction

Groundnuts are very nutritious plants that provide high proteins and energy (Kongkaew *et al.*, 2017). Nutrients contained in groundnuts are mostly in the form of lipids (44-45%), proteins (22-30%) and carbohydrates (9.5-19%) (Ayoola *et al.*, 2012). Groundnuts are usually consumed directly or processed into other edible products, e.g. boiled or roasted groundnuts or as peanut bars (Abdulrahman *et al.*, 2014).

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Cultivation of groundnuts is also good for soil maintenance. Their stems can be used as green manure, and their root nodules contain *Rhizobium* bacteria that can fix nitrogen from the air to become fertilizer for groundnuts and other plants cultivated nearby (Toomsan *et al.*, 2011). Groundnuts can be cultivated in every region of Thailand. Jogloy and Patanothai (2006) stated that although Thailand has widespread groundnut cultivation, its production is still insufficient for domestic consumption. In 2019, 14,921.28 hectares of groundnuts were cultivated, producing 31,097 tonnes of products, which translates to an average of 2,082 kg/hectare (Office of Agricultural Economics, 2019). Generally, Thai farmers cultivate groundnuts after the rice season to gain further income. This kind of cultivation can be completed in two ways: irrigation-water and rainwater utilization. The former cultivation type takes place in December to early January, and this crop is harvested in April and May. The latter happens in November and December, depending on the remaining soil moisture. Harvest is achieved from February until April. Thai provinces where most groundnut cultivation is transpired consist of Yasothon, Loei, Kalasin, Nakhon Ratchasima, Ubon Ratchathani, and Udon Thani (Bunphan and Boontha, 2018).

Udon Thani is a northeastern Thai province where groundnuts are widely cultivated. The groundnut variety Tainan 9 is preferentially cultivated in this area (Agricultural Technology Transfer and Service Center of Muangpia Subdistrict, 2019). In Udon Thani Province, Kudjub District is the most active place for groundnut cultivation. Formerly, farmers of this district cultivated groundnuts only as a raw material. Until 2007, groundnut production was in a state of oversupply, leading to a decline in its prices. Due to this difficult situation, a group of female farmers started to process groundnuts to solve the oversupply problem. First, they made sand roasted groundnuts and later branched into peanut bars and candied peanuts to increase value added (Thongmanee *et al.*, 2016).

Among their processed products, sand roasted groundnuts are the most popular. This reputation comes from standard production based on five procedures: selecting raw groundnuts, cleaning the raw groundnuts for quality control, roasting the raw groundnuts with sand, checking final quality of the sand roasted groundnuts and packaging, respectively. Using alums to easily clean groundnuts is included in some areas. In fact, the female farmers of Kudjub District have produced sand roasted groundnuts for 15 years. Also, they had formed community enterprises to run their business effectively. They are Nongno Community Enterprise, Nongkhong Community Enterprise and Khamjaroen Community Enterprise.

At present, the sand roasted groundnuts of the three community enterprises have been certified by the FDA and recognized as a 3-4 star OTOP product. Each of them has a million baht of working capital per year, showing potential of their cooperation and accomplishment of their goals. These facts convey their success and are interesting to be determined as a case study.

Therefore, the objectives were to examine three issues of the three community enterprises including costs and returns of sand roasted groundnut production, marketing, and business operation to maintain stability.

## **Materials and methods**

### ***The study area***

Three community enterprises in Kudjub District, Udon Thani Province were selected as study sites of this research because they are important areas of groundnut cultivation, and their OTOP products are 3-4 star rated. These community enterprises are comprised of: 1) Nongno Community Enterprise located in Nongno Village, Village No. 2, Kudjub Subdistrict; 2) Nongkhong Community Enterprise situated in Nongkhong Village, Village No. 4, Khonyung Subdistrict; and 3) Khamjaroen Community Enterprise based in Khamjaroen Village, Village No. 12, Muangpia Subdistrict.

### ***Population and sample size***

Population were 93 farmers from the three aforementioned community enterprises in Kudjub District, Udon Thani Province. However, only 40 of them were key informants who were selected by applying purposive sampling. These key informants provided information twice through the following two sessions:

Session 1 consisted of 40 key informants who were related to the marketing applied by their respective community enterprises. They were 15 members in each Nongno and Nongkhong Community Enterprises, and 10 persons were from Khamjaroen Community Enterprise.

Session 2 was relevant to costs. Supplying detailed information about the costs was acquired from 30 key informants who were 10 members from each of the community enterprises.

### ***Data collection***

Data collection was covered in four sessions.

Session 1: Related documentation and research were reviewed and assembled to find the primary location of sand roasted groundnut producers in Udon Thani Province. Eventually, it determined that Nongno, Nongkhong and Khamjaroen Community Enterprises in Kudjub District were these facilities.

Session 2: Surveying the target populations yielded their general information, which was used plan for systematic and sequential data collection. Based on its close proximity to Mueang District of Udon Thani Province, Khamjaroen Community Enterprise was chosen as the first data collection site. The subsequent sites were Nongkhong and Nongno Community Enterprises.

Session 3: Analysis of general information of the three community enterprises enabled planning to collect data, as well as design and adjustment of appropriate research tools. Each community enterprise provided two types of information, marketing data and followed by cost data. This was completed using the developed research tools: group interviews and structured questionnaires.

Group interviews and their subtopics aimed to acquire marketing data of the three community enterprises. It was completed with 40 key informants who were chairpersons, vice-chairpersons and representatives of these community enterprises. There were 15 key informants participating in this process from Nongno and Nongkhong Community Enterprises with an additional 10 persons from Khamjaroen Community Enterprise.

Structured questionnaires were designed with open-ended questions to access cost data of the three community enterprises. This tool was designed and adjusted using recommendations of three experts. The initial adjusted structured questionnaire was experimentally applied in a try-out with 30 groundnut farmers in Nongkhai Province. Results of the try-out enabled further improvement of the questionnaire. The revised tool was employed with 30 actual key informants, 10 from each community enterprise, who were chairpersons, vice-chairpersons and members of the three community enterprises in Kudjub District.

Session 4: The acquired data were analyzed, summarized and reviewed to identify effective results and areas for further study.

### ***Data analysis***

In this research, marketing and cost data were analyzed. The marketing data was examined with qualitative data analysis technique, i.e. analytic induction. Cost data was quantitative in nature. It was analyzed through descriptive statistics including mean, values, frequencies and percentages. Cost and return data were also analyzed using the following relationships (Kay *et al.*, 2016):



decreased to 10 people. The members of Nongno and Khamjaroen Community Enterprises were all females, except in Nongkhong Community Enterprise in which three males participated. The average ages of the members of Khamjaroen, Nongno, and Nongkhong Community Enterprises were 62, 52, and 46 years, respectively.

These members are farmers. They have cultivated several crops, but groundnuts are their primary focus. Generally, they cultivate groundnuts after the rice season, and the average areas of their groundnut cultivation vary. The highest level of groundnut cultivation was in Nongno Community Enterprise, covering 0.16-0.48 hectares/household. Nongkhong and Khamjaroen Community Enterprises each cultivated as 0.16-0.32 hectares/household of groundnuts. Yields of their cultivated groundnuts were disparate. Nongno Community Enterprise had the highest yield of groundnuts (1,625 kg/hectare/year), followed by Khamjaroen Community Enterprise (1,500 kg/hectare/year) and Nongkhong Community Enterprise (1,437.5 kg/hectare/year). The three community enterprises had the same goal to produce edible groundnut products through processing.

Purchase volumes of groundnuts as raw materials of the three community enterprises are disparate. A field survey in 2020 indicated that the estimated order quantities of groundnuts as raw materials within Kudjub District by Nongno, Nongkhong, and Khamjaroen Community Enterprises were 50, 30, and 17 tonnes/year, respectively. Based on the data, Nongno Community Enterprise had sufficient raw materials to produce 50 tonnes of processed groundnut products annually without ordering further raw materials. Nongkhong and Khamjaroen Community Enterprises needed to process 40 and 20 tonnes/year of groundnuts, respectively, but the groundnut supply within the district was insufficient. Therefore, they purchased groundnuts from outside the district. Nongkhong Community Enterprise ordered 10 tonnes of groundnuts from Loei and Lampang Provinces, while Khamjaroen Community Enterprise bought three tonnes of groundnuts from Loei Province annually.

### ***Products***

A product survey indicated that all the three community enterprises produced sand roasted groundnuts as a primary product. Nongno Community Enterprise produced sand roasted groundnuts (99.07%) under the brand name Sa-Noe, which qualified as a 3-star OTOP product. There was only one size of their product, a 120 g/packet. Nongkhong Community Enterprise produced sand roasted groundnuts (99.07%) under the brand name Kong-Tong, which is a 4-star OTOP product. There were two sizes of their product, 50 and 120

g/packets. Last, Khamjaroen Community Enterprise produced sand roasted groundnuts (99.06%) under the brand name Kao-Manee that qualified as a 3-star OTOP product. They had only one product size, a 120 g packet.

Sand roasted groundnut products of the three community enterprises are considered high quality since they have the FDA logo that constitutes an endorsement by the Food and Drug Administration, Ministry of Public Health, Thailand. Product images from each community enterprise are displayed in Figure 1.



**Figure 1.** Sand roasted groundnuts of the three community enterprises

### *Other products made of groundnuts*

While sand roasted groundnut production was primary among the three community enterprises, each group also processed groundnuts into other edible products. The purposes were to diversify their markets and to create the value added for their products, as well as to offer alternatives to consumers.

In group interviews, it was revealed that Nongno Community Enterprise processed groundnuts into peanut bars (0.2%) and fried peanuts with herbs (0.1%). Nongkhong Community Enterprise manufactured candied peanuts (0.2%) and produced crushed peanuts (0.1%) from groundnuts. Khamjaroen Community Enterprise made peanut bars (0.2%), candied peanuts (0.1%), and fried peanuts with herbs (0.1%). However, these new processed products were not well-known, so their sales were not as expected.

## Prices

The current study considered both retail and wholesale prices of processed groundnuts. These prices were different among the three community enterprises. Nongno Community Enterprise revealed that their retail price for sand roasted groundnuts (120 g) was 20-25 baht/packet. Their wholesale price of each sand roasted groundnut packet (120 g) contained in a master pack (10 packets/master pack) was 14 baht. Moreover, their sales volume averaged 9,560 packets/month.

Khamjaroen Community Enterprise set the retail price of their sand roasted groundnuts (120 g) so that it is similar to that of Nongno Community Enterprise, i.e. 20-25 baht/packet. Among them, the wholesale price of Khamjaroen Community Enterprise was higher. In other words, their wholesale price of each sand roasted groundnut packet (120 g) contained in a master pack (10 packets/master pack) was 16 baht. Meanwhile, their sales volume was 5,534 packets/month, which was less than that of Nongno Community Enterprise.

Nongkhong Community Enterprise also had the same retail price for their 120 g packets of sand roasted groundnuts, 20-25 baht/packet. Moreover, they also offered a 50 g packet of sand roasted groundnuts that retailed at 5 baht/packet. Their wholesale prices for 120 g and 50 g packets of sand roasted groundnuts in a master pack (10 packets/master pack) were 14 and 3.50 baht, respectively. Nongkhong Community Enterprise's wholesale price for 120 g packets was equal to that of Nongno Community Enterprise but less than Khamjaroen Community Enterprise. Additionally, their sales volume for 120 g products was 7,545 packets/month, higher than Khamjaroen Community Enterprise but less than Nongno Community Enterprise. Furthermore, their sales volume for 50 g packets was 200 packets/month (Table 1).

**Table 1.** Sand roasted groundnut prices of the three community enterprises

Community enterprises	Details	Quantity	
		50 g/packet	120 g/packet
Nongno	Retail price	-	20-25 baht
	Wholesale price	-	14 baht
	Average sales volume/month	-	9,560 packets
Khamjaroen	Retail price	-	20-25 baht
	Wholesale price	-	16 baht
	Average sales volume/month	-	5,634 packets
Nongkhong	Retail price	5 baht	20-25 baht
	Wholesale price	3.5 baht	14 baht
	Average sales volume/month	200 bags	7,545 packets



### ***Product placement***

The sand roasted groundnuts of the three community enterprises were sold both within and outside Udon Thani Province. Products of Nongno Community Enterprise were sold in Udon Thani Province at five places: Dao Tiam Noodle Shop (24.39%), retail shops in Udon Thani Airport (14.63%), Pond Namnueang (14.63%), the storefront of Nongno Community Enterprise (12.20%), and VT Namnueang (4.88%). Their four customers outside Udon Thani Province were Tops Supermarket in Bangkok (12.20%), Lemon Farm in Nakhon Ratchasima Province (7.32%), Cheevit Jitjai Shop in Nakhon Ratchasima Province (4.88%), and Khai Shop at Khon Kaen Airport (4.87%).

Nongkhong Community Enterprise had five customers in Udon Thani Province as follows: retail shops in Udon Thani Airport (30.30%), the storefront of Nongkhong Community Enterprise (15.15%), Mae Tui Para Bong Shop (9.09%), Big C Udon Thani (6.06%), and OTOP Shops Udon Thani (1.52%). Additionally, their orders outside Udon Thani Province came from retail shops in Bangkok (24.24%), Lemon Farm in Bangkok (7.58%), and Phu Luang Trang in Trang Province (6.06%).

Last, Khamjaroen Community Enterprise received the orders from four customers in Udon Thani Province: the storefront of Khamjaroen Community Enterprise (55.56%), Udon Thani Hospital (5.56%), Mueang Tong Market (5.56%), and Palung Boon Shop (2.77%). Furthermore, sales to Mueang Tong Thani in Bangkok (27.78%) and wholesale shops in Nongkhai Province (2.77%) were their primary orders outside Udon Thani Province.

### ***Sales promotion***

The sales promotion among the three community enterprises was similar. The strategy, “Buy 100 packets, get 1 packet free” was their primary sales promotion, and it attracted consumers to purchase their products in increasing quantities. Another strategy was participated in various commodity fairs held by the government sector to showcase their products in a booth. These activities helped advertise their products to the public and expand their markets to those who were interested in reselling the products.

### ***Costs and returns of sand roasted groundnut production by Nongkhong Community Enterprise***

The equations (1), (2), and (3) which were followed from Kay *et al.* (2016) revealed that the total cost of 120 g of sand roasted groundnuts produced

by Nongkhong Community Enterprise was 9.6700 baht/packet. Its average cash variable cost was 8.4068 baht/packet (86.9369%), with an average noncash fixed cost that was totally 1.2632 baht/packet (13.0631%). The first three highest cash variable costs were gathered from raw groundnuts (4.3750 baht/packet or 45.2430%), labor (3.0912 baht/packet or 31.9669%), and small bags for packaging (0.4370 baht/packet or 4.5191%). Other costs were considered from gas, big bags for multiple packages, delivery expenses, plastic carrier bags, electricity, water and sand. The highest noncash fixed cost got from depreciation of their production facilities as 0.9009 baht/packet (9.3164%). Others costs were depreciation of processing equipment including a roaster, cleaning machine, and vacuum sealer. Their wholesale price of each packet of sand roasted groundnuts (120 g) on the basis of a master pack (10 packets/master pack) was 14 baht/packet. The return from their sand roasted groundnuts was 4.33 baht/packet (Table 2).

**Table 2.** Sand roasted groundnut costs of Nongkhong Community Enterprise

Cost	Nongkhong Community Enterprise			
	Cash cost/ packet (baht)	Noncash cost/ packet (baht)	Total (baht)	Percent (%)
1. Total variable costs	8.4068	-	8.4068	86.9369
- Raw groundnuts	4.3750	-	4.3750	45.2430
- Labor	3.0912	-	3.0912	31.9669
- Small packaging bags	0.4370	-	0.4370	4.5191
- Gas	0.4020	-	0.4020	4.1572
- Large packaging bags	0.0500	-	0.0500	0.5171
- Delivery expenses	0.0263	-	0.0263	0.2720
- Plastic carrier bags	0.0100	-	0.0100	0.1034
- Electricity expenses	0.0094	-	0.0094	0.0972
- Water expenses	0.0053	-	0.0053	0.0548
- Sand	0.0006	-	0.0006	0.0062
2. Total fixed cost	-	1.2632	1.2632	13.0631
- Depreciation of the production facility	-	0.9009	0.9009	9.3164
- Depreciation of a roaster	-	0.1502	0.1502	1.5533
- Depreciation of a cleaning machine	-	0.1089	0.1089	1.1262
- Depreciation of a vacuum sealer	-	0.1032	0.1032	1.0672
3. Total cost/packet (120 g)			9.67	100
4. Wholesale price/packet/master pack			14	
5. Return/packet			4.33	

### ***Costs and returns of sand roasted groundnut production by Nongno Community Enterprise***

The total cost of 120 g of sand roasted groundnuts producing by Nongno Community Enterprise was 8.9748 baht/packet. Its average cash variable cost was 7.8767 baht/packet (87.7646%), and the noncash fixed cost was totally 1.0981 baht/packet (12.2354%). The three highest cash variable costs were derived from raw groundnuts (3.7000 baht/packet or 41.2265%), labor (3.0912 baht/packet or 31.9669%), and small packaging bags (0.4370 baht/packet or 4.5191%). Other expenses were for gas, transportation, big packaging bags, electricity, plastic carrier bags, water, sand and alum. The highest noncash fixed cost resulted from depreciation of their facility was 0.9009 baht/packet (9.3164%). Other costs were depreciation of a groundnut roaster and vacuum sealer. Because the wholesale price of each packet of sand roasted groundnuts (120 g) was based on a master pack (10 packets/master pack), it made the price to 14 baht/packet. Their return was 5.02 baht/packet (Table 3).

**Table 3.** Sand roasted groundnut costs of Nongno Community Enterprise

Cost	Nongno Community Enterprise			
	Cash cost/ packet (baht)	Noncash cost/ packet (baht)	Total (baht)	Percent (%)
1. Total variable costs	7.8767	-	7.8767	87.7646
- Raw groundnuts	3.7000	-	3.7000	41.2265
- Labor	3.1503	-	3.1503	35.1016
- Small packaging bags	0.4370	-	0.4370	4.8692
- Gas	0.4050	-	0.4050	4.5126
- Transportation expenses	0.0750	-	0.0750	0.8357
- Big packaging bags	0.0600	-	0.0600	0.6685
- Electricity expenses	0.0204	-	0.0204	0.2273
- Plastic carrier bags	0.0200	-	0.0200	0.2228
- Water expenses	0.0075	-	0.0075	0.0836
- Sand	0.0012	-	0.0012	0.0134
- Alum	0.0003	-	0.0003	0.0033
2. Total fixed cost	-	1.0981	1.0981	12.2354
- Depreciation of the production facility	-	0.9226	0.9226	10.2799
- Depreciation of a roaster	-	0.0930	0.0930	1.0362
- Depreciation of a vacuum sealer	-	0.0825	0.0825	0.9192
3. Total cost/packet			8.9748	100
4. Wholesale price/packet/master pack			14	
5. Return/packet			5.02	

***Costs and returns of sand roasted groundnut production by Khamjaroen Community Enterprise***

The total cost of 120 g of sand roasted groundnuts producing by Khamjaroen Community Enterprise was 8.0652 baht/packet. The average cash variable cost was 6.3836 baht/packet (79.1499%), while the noncash fixed cost was totally 1.6816 baht/packet (20.8501%). The three highest cash variable costs were received from raw groundnuts (3.7500 baht/packet or 46.4961%), labor (1.1236 baht/packet or 13.9315%), and small packaging bags (0.9500 baht/packet or 11.7790%). Others costs got from gas, transportation, big packaging bags, electricity, plastic carrier bags, water, alum and sand. The highest noncash fixed cost caused by depreciation of their production facility was 0.9363 baht/packet (11.6091%). Others costs were depreciation of equipment including a cleaning machine, vacuum sealer, roaster, and shelling machine. Because the wholesale price for each packet of sand roasted groundnuts (120 g) based on a master pack (10 packets/master pack) was 16 baht/packet, the return of their sand roasted groundnuts per packet was 7.93 baht/packet (Table 4).

**Table 4.** Sand roasted groundnut costs of Khamjaroen Community Enterprise

Cost	Khamjaroen Community Enterprise			
	Cash cost/ packet (baht)	Noncash cost/ packet (baht)	Total (baht)	Percent (%)
1. Total variable costs	6.3836	-	6.3836	79.1499
- Raw groundnuts	3.7500	-	3.7500	46.4961
- Labor	1.1236	-	1.1236	13.9315
- Small packaging bags	0.9500	-	0.9500	11.7790
- Gas	0.4101	-	0.4101	5.0848
- Transportation	0.0624	-	0.0624	0.7737
- Big packaging bags	0.0450	-	0.0450	0.5580
- Electricity	0.0187	-	0.0187	0.2319
- Plastic carrier bags	0.0105	-	0.0105	0.1302
- Water	0.0075	-	0.0075	0.0930
- Alum	0.0030	-	0.0030	0.0372
- Sand	0.0028	-	0.0028	0.0347
2. Total fixed costs	-	1.6816	1.6816	20.8501
- Depreciation of the production facility	-	0.9363	0.9363	11.6091
- Depreciation of a cleaning machine	-	0.2172	0.2172	2.6931
- Depreciation of a vacuum sealer	-	0.2060	0.2060	2.5542
- Depreciation of a roaster	-	0.2022	0.2022	2.5071
- Depreciation of a shelling machine	-	0.1199	0.1199	1.4866
3. Total costs			8.0652	100
4. Wholesale price/packet/master pack			16	
5. Return/packet			7.93	

***Comparison of costs and returns of three community enterprises***

Comparison results from a post-hoc ANOVA test and Dunnett T3 indicated that costs and returns of the three community enterprises were significantly different at a statistical level of 0.05 (Tables 5 and 6).

**Table 5.** Costs of three community enterprises analyzed using a post-hoc ANOVA test and Dunnett T3

Community enterprise	Cost			
	Nongno	Nongkhong	Khamjaroen	
	9.6700	8.9748	8.0652	
Nongno	9.6700	-	0.6952*	1.6048*
Nongkhong	8.9748	-	-	0.9096*
Khamjaroen	8.0652	-	-	-

\* =  $p < 0.05$

**Table 6.** Returns of three community enterprises analyzed using a post-hoc ANOVA test and Dunnett T3

Community enterprise	Return			
	Nongno	Nongkhong	Khamjaroen	
	4.3300	5.0200	7.9300	
Nongno	4.3300	-	-0.6960*	-3.6048*
Nongkhong	5.0200	-	-	-2.9088*
Khamjaroen	7.9300	-	-	-

\* =  $p < 0.05$

**Discussion**

In the marketing of the three community enterprises, each group created their own brand names to give their products distinctive identities and to influence the customer purchasing decisions. This is in agreement with Mamad and Taweasuk (2018), who studied brand images that influenced the decision-making process of buying sausages in a particular convenience store in Bangkok. They found that the image and reputation of a brand name influenced customer decision making about their purchases.

In addition to the marketing results, the packaging data also revealed that the three community enterprises had similar sand roasted groundnut packets,

i.e., a 120 g/packet. Nongkhong Community Enterprise also had a 50 g packet that was created to serve customer needs and expand markets to other groups. The study also showed that income increased with introduction of new products and market expansion. This was examined in the study of Cheewaree (2012), who investigated development of packaging for processed pork products as part of a marketing promotion. In this case study, packaging of processed pork products in a local community of Nakhonpathom Province was examined. Their results indicated that developing a package to meet customer needs and tastes was essential. In this case study, it helped the products appear worthy of purchase, attracted customers to more easily purchase, and made carrying the products easier for the customers.

Another result was related to the products. Sand roasted groundnuts of the three community enterprises were more desirable as they were endorsed by the FDA and also received OTOP star ratings from the Community Development Department. The highest possible OTOP score is 5-star OTOP. Sand roasted groundnuts of Nongkhong Community Enterprise received a 4-star OTOP rating while the other two community enterprises received 3-star OTOP scores. Definitely, this confirmed the quality of the products, which later affected customer confidence leading them to purchase the products. These circumstances are in agreement with the study of Prayalaw and Manmart (2015), who examined factors affecting consumer purchasing decisions of food products in One Tambon One Product (OTOP) program in Khon Kaen Province. Their findings showed that the most important factors influencing consumer purchasing decisions were food cleanliness and safety. Other influential factors were the food taste, its standard certifications by the Thai Community Product Standard, Food and Drug Administration, and the Islamic Committee Office of Thailand, among others. Besides, the food label indicating nutrition facts, ingredient lists, as well as the manufacturing and expiry dates was also important.

In addition to the product results, prices and sales locations were also interesting. The wholesale prices of Nongno and Nongkhong Community Enterprises were identical, 14 baht/packet (120 g), while the wholesale price of Khamjaroen Community Enterprise was 16 baht/packet (120 g). The product placement was different; although, they were sold in similar local markets. Their products were primarily sold in various local markets in Udon Thani Province as opposed to sales in other provinces. The places that distributed their respective products were different to avoid unintended competition. There was only one place – Udon Thani Airport – where the products of Nongno and

Nongkhong Community Enterprises were sold in the same area. In fact, members of the three community enterprises were elders who considered it difficult to sell products directly, especially outside the province. Consequently, it would be easier to have other sales channels such as online sales channels to expand their market and drive sales revenue. Sukglun *et al.* (2018) examined strategies for creating competitive advantages for smart farming enterprises. They stated that creating online sales channels was an effective strategy to better meet customer needs today. Generally, advances in communication technology have affected agricultural businesses since merchandisers must engage in online marketing to serve consumer needs and behavior. Online marketing is a key factor for smart farming enterprises as it helps explicitly specify target consumers and deliver information about agricultural products directly to them.

The sales promotions of the three community enterprises were also similar. Their promotion strategy was in the form of volume discounts. The customers could receive free products after purchasing a specified quantity. Offers such as “Buy 100 packets, get one packet free” were used. This approach came from interaction between the three community enterprises to create similar sales promotions so that they would not clash in the market. Such a promotion was only one channel of their sales activities. They should have other promotional channels to increase their sales volume such as listings through advertising boards, leaflets, brochures, public relations or online media. Puangpejara *et al.* (2016) did a study regarding a marketing promotion through collaboration within Rai San Fan Community Enterprise in Nikhom Sang Ton-eng Subdistrict, Mueang District, Lop Buri Province. They suggested guidelines for effective sales promotions. To make products widely known, a community enterprise must focus on advertisement through various media channels such as advertising boards, community radio, local newspapers and social media. Moreover, a community enterprise should give importance to public relations, sales promotion and personal selling as well as motivating members of the community enterprise to participate in marketing promotions.

Another result was related to costs. The highest variable cost of the three community enterprises came from raw materials (raw groundnuts). This result is in agreement with Ditkaew *et al.* (2015), who examined the costs and returns of producing herbal fried groundnuts under the campaign, One Tambon One Product (OTOP), in Num Rueom Subdistrict, Mueang District, Tak Province. They found that the highest cost for herbal fried groundnut production was also for the raw materials (44%). Among the three community enterprises, the

highest raw material costs were incurred by Nongkhong Community Enterprise. This came from raw groundnuts because of the extra labor of farmers who cultivated them. These raw groundnuts must be selected, screened and cleaned before delivery. Therefore, their price was higher than for groundnuts which that had not been preprocessed in this way. As a result, the raw material costs of the other two community enterprises, Khamjaroen and Nongno, were lower.

While the raw material costs of Nongkhong Community Enterprise were the highest, its labor costs were the second highest. The labor costs of Khamjaroen Community Enterprise were the lowest. In fact, labor costs were an important factor motivating the community enterprise's members to help make the sand roasted groundnuts. Unfortunately, few members of Khamjaroen Community Enterprise were found to help make sand roasted groundnuts since their wage was very low, only 100 baht/day. Khamjaroen Community Enterprise made the highest return as they had the lowest costs and the highest product price.

In summary, the three community enterprises were very similar in their sand roasted groundnut production. Only Nongkhong Community Enterprise was found not to use alum in washing raw groundnuts. The three community enterprises' product brand names and sales locations were different. The highest product price was gained by Khamjaroen Community Enterprise. The three community enterprises had identical promotions, buy 100 packets and get 1 packet free. The costs of the three community enterprises' products were different. Nongkhong Community Enterprise had the highest cost (9.67 baht/packet), followed by Nongno Community Enterprise (8.97 baht/packet) and Khamjaroen Community Enterprise (8.06 baht/packet). Their similarly high variable and fixed costs came from purchasing raw groundnuts along with facility and equipment depreciation. Their return varied. Khamjaroen Community Enterprise had the highest return (7.93 baht/packet), followed by Nongno Community Enterprise (5.02 baht/packet) and Nongkhong Community Enterprise (4.33 baht/packet).

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