



NHIỀU TÁC GIẢ

KỶ YẾU

**HỘI THẢO KHOA HỌC QUỐC TẾ
DÀNH CHO CÁC NHÀ KHOA HỌC TRẺ
KHỐI KINH TẾ VÀ KINH DOANH**

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**ECONOMIC EFFICIENCY OF HI-TECH CANTALOUPE PRODUCTION IN
THUA THIEN HUE PROVINCE: A CASE STUDY IN HAI FARM, THUY BIEU WARD,
HUE CITY**

**HIỆU QUẢ KINH TẾ CỦA HOẠT ĐỘNG SẢN XUẤT DƯA LƯỚI CÔNG NGHỆ CAO Ở
TỈNH THỪA THIÊN HUẾ: TRƯỜNG HỢP NGHIÊN CỨU TẠI TRANG TRẠI HẢI FARM,
PHƯỜNG THỦY BIỀU, THÀNH PHỐ HUẾ**

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ABSTRACT

This research aims to estimate the economic efficiency of hi-tech cantaloupe Hai Farm in Hue city. Both qualitative and quantitative research method are applied. Data is collected from the manager of Hai Farm as well as 40 customers who used Hai Farm product. The results show that: (1) With 1,500 m² total area, Hai Farm has increased their revenue and profit through three crops. At the first crop, the profit is only 11.45 million dong. Until the second crop, this result has changed to 125.9 million dong, and received the best result in the third crop, with 210.91 million dong. This is a good indication of Hai Farm's cantaloupe when they change the density of crop. (2) This research also conducts the sensitivity analysis of profit when the retail price of cantaloupe is from 55,000 dong to 75,000 dong. When price level is changed, the profit has a large change and still positive. (3) The customers are completely trust for the quality, safety standard, and the form of cantaloupe from Hai Farm. In the future, this model should be expanded in Thua Thien Hue province to respond for the market.

Keywords: *Hi-tech production model, cantaloupe, Hai Farm.*

TÓM TẮT

Nghiên cứu này nhằm ước tính hiệu quả kinh tế của trang trại dưa lưới công nghệ cao Hải Farm ở thành phố Huế. Phương pháp nghiên cứu định tính và định lượng đều được áp dụng. Số liệu được thu thập từ người quản lý trang trại Hải Farm và 40 khách hàng đã sử dụng sản phẩm dưa lưới của trang trại này. Kết quả cho thấy: (1) Với tổng diện tích 1.500 m², Hải Farm đã tăng doanh thu và lợi nhuận qua ba vụ. Ở vụ đầu tiên, lợi nhuận chỉ đạt được 11,45 triệu đồng. Đến vụ thứ hai, kết quả đã thay đổi thành 125,9 triệu đồng và tốt nhất là vụ thứ ba, với 210,91 triệu đồng. Đây là một dấu hiệu tốt cho trang trại dưa lưới Hải Farm khi thay đổi mật độ cây trồng. (2) Nghiên cứu này cũng tiến hành phân tích độ nhạy của lợi nhuận khi giá bán lẻ dưa lưới từ 55.000 - 75.000 đồng. Khi mức giá được thay đổi, lợi nhuận có sự thay đổi lớn và vẫn tích cực. (3) Khách hàng hoàn toàn tin tưởng vào chất lượng, tiêu chuẩn an toàn và hình thức dưa lưới của trang trại Hải Farm. Trong tương lai, mô hình này nên được mở rộng tại tỉnh Thừa Thiên Huế để đáp ứng cho thị trường.

Từ khóa: *Mô hình sản xuất công nghệ cao, dưa lưới, Hải Farm.*

1. Introduction

Cultivation of cantaloupe trees by traditional methods is only suitable in the dry season while the rainy season is not favorable. In the context of negative impacts of climate change such as drought, high temperature during summer, and flood in the rainy season, the application of high technology in agricultural production using greenhouse is on the rise. Cultivation in the membrane house will overcome the disadvantage of rainy season. By applying hi-tech agricultural production in cantaloupe, it has created a large number of products with high productivity, good quality and especially environmentally friendly, which are widely used. Therefore, the production process is continuous, not seasonal as traditional farming which helps plants will not be affected much by the weather and climate factors [1].

Cantaloupe had not planted in Thua Thien Hue province before due to the weather condition. Hai Farm certifies for their success in the application of high technology in cantaloupe cultivation when has

founded since May 2017. Their product sells at some organic agricultural product stores, supermarkets in Hue city. However, at the current price level, the product still does not really have a position in the domestic market despite of having the high safety level. Adopting the hi-tech cantaloupe production, the producers must prepare a large source of capital, thoroughly investigate and select varieties of cantaloupe will fit and bring high value. It is important to pay attention to the control and selection of clean water sources (regular pH test...), the substrate must be carefully treated before starting a crop, do not abuse of pesticides... [3]. Based on that fact, we select the topic: *"Economic efficiency of hi-tech cantaloupe production in Thua Thien Hue province: A case study in Hai Farm, Thuy Bieu ward, Hue city"* to have the fully evaluation of this production and identify the direction in the future.

2. Overview of hi-tech cantaloupe production in Vietnam

Initially, cantaloupe is grown in Da Lat, Ho Chi Minh, Binh Duong, and expanded to Dong Nai, Lam Dong and some provinces in the Mekong Delta as: Ben Tre, Dong Thap...

In Northern of Vietnam, Delco Agriculture Company has 6 ha Delco Farm which is one of the most intelligent and modern farming models. This farm is located in Thuan Thuanh district, Bac Ninh province and applies 100% of information technology to produce clean agricultural products. In which, a Japanese cantaloupe greenhouse has built for nearly 60 billion dong. A sensor installation system is set up to connect via software to measure all parameters of the soil and water environment. The operation of farm system restricts human labor, the technical staff mainly monitors and controls through the system of machines. In addition, all products are produced which has a traceability code (QR Code) to check origin and process. By the application of advanced technology, the management and production strictly follow the 5S practice model and VietGAP standard. The agricultural production eliminates the damage factors, giving the clean products and high quality. Delco cantaloupe growing area has increased from 3.500 m² to 7.300 m², giving an output of 48 tons/year for supermarkets, shops and clean food chain stores. Currently, cantaloupe is sold to the market about 150.000 dong/kg, resulting in billions dong profit annual [4].

In Ho Chi Minh City, the cantaloupe is grown mainly in greenhouse - Israel technology house. Most of the cantaloupe varieties are grown in the greenhouse reached highly effective. Several trials when grow orange flesh cantaloupe, hard skin, have nets on the fields in the dry season and the rainy season has been conducted but the results have not achieved as expected. According to Department of Agriculture and Rural Development in Ho Chi Minh City, while the average value per hectare of agricultural land has not reached 400 million dong per year, each hectare of cantaloupe cultivation can bring 3-4 billion dong. In addition, the survey of the Agricultural hi-tech Park shows that the profits of growing cantaloupe are quite high, about 28-32% [4].

Currently, neighboring provinces have advantages in terms of land prices and the land area has begun to experiment with growing cantaloupe in the greenhouse and achieved some positive results. The price and output of cantaloupe is often stable because of clear agreement in production. According to some traders, cantaloupe growers in Binh Duong and Dong Nai are quite united in terms of price and control of output. Therefore, in the past years, the output of the cantaloupe continued to grow steadily. It did not meet the case of reducing price as have a good harvest like other fruits [4].

Cantaloupe grows well in warm and dry climates, with plenty of light. This fruit provides vitamin A, vitamin C, nutrients such as vitamin E and folic acid, which are important antioxidants in the process nutritional metabolism of human. Therefore, although there is no cantaloupe farm in Hue, the consumption of cantaloupe is very high. In Hue city, the temperature of summer is above 30°C and high humidity, growing cantaloupe in outdoor conditions is a challenge. Therefore, they need the intervention of machinery and equipment for regulating the climate that help the tree better adapted.^[5] To respond for local demand, supermarkets or clean agricultural products shops have imported cantaloupe from other regions. Hai Farm is the first hi-tech cantaloupe farm in Hue city. This research focuses on analyzing the

economic efficiency of hi-tech cantaloupe production at Hai Farm as well as conducting the sensitivity analysis of profit when the retail price increases or decreases. From this, recommending some solutions to expand this production in Thua Thien Hue province.

3. Research methods

3.1. Data collection

This research utilizes the qualitative and quantitative method. Qualitative data is from in-depth interview with the owner of Hai Farm. Semi-structured questionnaire is prepared to collect the information about their motivation, initial investment cost for production, cantaloupe season, total cost per crop, production results, and distribution chain of cantaloupe in Hai Farm. From this, calculating the economic efficiency of this production and figure out the experience lessons for other hi-tech farms. Furthermore, data also sums up from reports, articles on book, magazines, internet materials...

Quantitative data collects from the customer survey about Hai Farm's hi-tech cantaloupe. There are 40 customers are selected by random sampling, non-repeat with a structure questionnaire. This investigation focuses on consumers' perception and evaluation about Hai Farm product at selling places such as Big C, Hue Viet organic agricultural shops and Hai Farm. In detail: we interviewed 19 customers who were being selected cantaloupe at the agricultural products counter on the 2nd floor of Big C supermarket. At Hue Viet organic agricultural product shop in No.19 Truong Chinh street, we directly interviewed 8 people. Finally, we directly interviewed 10 customers at Hai Farm and 3 customers via online by using the google form tool.

3.2. Data analysis

The data is synthesized and analyzed to achieve the research objectives. The statistical method of description, comparison,... are used to have the comments, explanation for the research problem. The indicators such as revenue, cost, profit, total revenue/ total cost, profit/ total cost, profit/ total revenue are referred in this research.

Due to high initial investment cost, it is necessary to clarify the effects of profit when retail price changes by applying the sensitivity analysis.

4. Results and discussion

4.1. Overview of hi-tech cantaloupe production in "Hai Farm"

Hai Farm is a hi-tech agricultural production facility, designed in accordance with Watanbe's standards - a leading Japanese company in the greenhouse sector. The houses are made of galvanized steel which bearing the force, withstand winds of 120 km/h, the thick net system 180-200 microns, around with insect barrier. The membrane system can close or open depending on weather condition. The production process of hi-tech cantaloupe in Hai Farm is as follow:

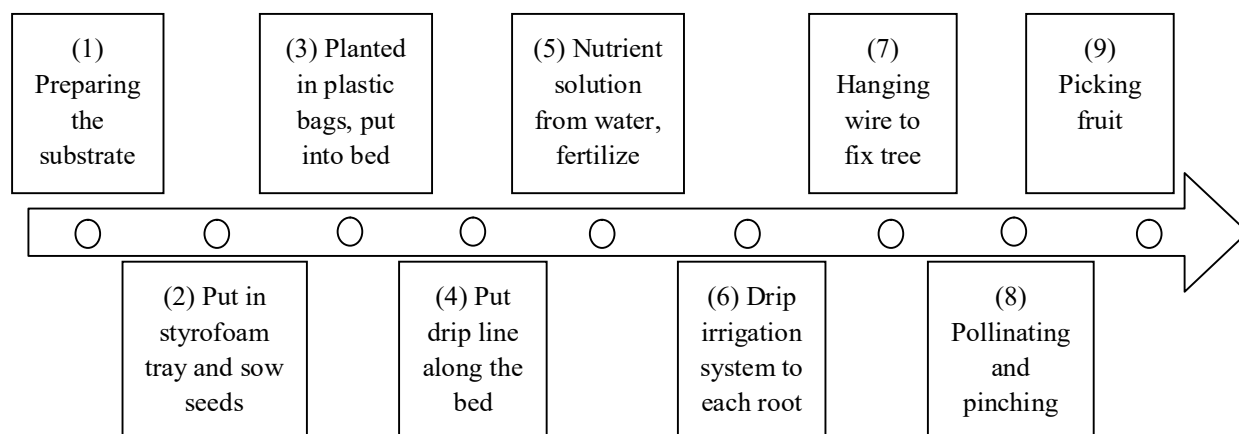


Figure 1: Process of cantaloupe production in Hai Farm

Source: In-depth interview with Hai Farm manager, 2018

Cantaloupe is grown in the plastic bags and care according to the hydroponic method. After making beds, it is placed drip line running along the bed, parallel and been far from each tree about 5-7 cm. Fertilizer is mixed with the nutrient solution in the fixed proportion to be calculated, followed a drip irrigation system to each root. This irrigation system not only saves water but also limits nutrient loss. When the tree grows well, start hanging the vertical wire to fix tree which will supported by a cable system linking with the frame to save space, help trees have enough space, light to develop as well as easy for pruning, picking fruit, pollinating and preventing diseases for trees. After 90 days, farm will harvest the cantaloupe for selling. Annual, Hai Farm grows 3 seasons: the first crop from April to June, the second crop from August to October, and the last crop from December to February of the following year for serving customer's demand during Lunar New Year. Hai Farm plants average 3.000 trees/crop and let only one fruit/ tree to increase the quality of cantaloupe.

4.2. Economic efficiency of hi-tech cantaloupe production in "Hai Farm"

4.2.1. Investment costs in producing cantaloupe

In agriculture, the land directly affects and decides on the production process. It is the main material in agricultural production. When every cantaloupe crop ends, Hai Farm spends one month to renovate the land, conduct the treatment, clean farm to limit the pathogens to the maximum, increase the soil fertility, help each seedling of cantaloupe grow up healthy, not pests. Hai Farm has used up 1.500 m² of land for cantaloupe production. According to manager of Hai Farm, the initial investment cost for technical equipment and production materials on 1.500 m² in 2017 is identified as follow:

Table 1: Initial investment cost of Hai Farm on 1,500 m² area

No.	Initial investment	Depreciation period (years)	Cost (Million VND)
1	Land		600,00
2	Greenhouse	10	500,00
3	Drip irrigation system	5	30,00
4	Controller for fertilizer, mist spraying system	10	28,50
5	Irrigation system, fertilizer automatic	10	25,50
6	The frame and rack system	10	20,00
7	Air convection fan	5	10,00
8	pH test machine	10	1,00
Total			1.215,00

Source: Hai Farm, 2018

The greenhouse is also equipped with roof irrigate and air convection fan. Accordingly, when experiencing hot weather, the system will automatically water to reduce the temperature and amount of sunlight from the roof. The fan will mix the air in the membrane to the temperature region and then push the air through the roof to help prevent thermal shock to trees. Hai Farm is also equipped with temperature control systems, humidity, intelligent lighting device comes with include: Israel drip irrigation system, automatic irrigation system, temperature, and humidity sensors,... All of them connect to the central controller. That function receives the parameters from the sensor which program to adjust automatically watering, fertilizing, ventilation, ensuring an ideal environment, nutrients for growing trees. From table 1, we can see that the total initial investment cost for the production of cantaloupe reached 1.215 million VND. In which, the owner's capital spent is 715 million VND, the remaining 500 million VND is borrowed from the bank at an interest rate of 7,2% per year.

Cost of hi-tech production is expensive and it takes long time to recover the investment for farmers. This system requires the producer to have the good knowledge of science and technology in the production process. These expenses are mainly for the purchase of land production (600 million dong) and construction of greenhouses for production (500 million). In addition, Hai Farm also invested in other equipments such as drip irrigation system, controller for fertigation system and mist spray system, irrigation system, fertilizer automatic, frame and rack system, air convection fan, pH test machine. These devices have a total cost of 115 million VND. In general, the total investment cost for technical equipment, production materials in Hai Farm is very large. The straight line depreciation is applied to calculate the cost of materials, labor and fixed costs for producing the cantaloupe. The results are described as follow:

Table 2: Total cost per crop on 1,500 m² in the period of 2017-2018

Unit: million VND

No.	Costs	Crop 1 (Apr – Jun)		Crop 2 (Aug – Oct)		Crop 3 (Dec – Feb)		Average cost
		Quantity	Price	Quantity	Price	Quantity	Price	
I	Material costs		57,72		47,27		50,76	51,92
1	Seeds (300.000 dong/package)	7	2,10	6	1,80	6	1,80	1,90
2	Material for substrate		8,50		7,50		7,95	7,98
3	Nursery tray (40.000 dong/tray) reused in 3 crops ^(1*)	70	0,93	54	0,93	60	0,93	0,93
4	Electric		9,72		8,68		9,01	9,14
5	Wire, hangers fixed trees		15,30		9,59		11,7	12,20
6	PE bag (4.000 dong/bag) reused in 3 crops ^(2*)	3.500	4,67	2.700	4,67	3.000	4,67	4,67
7	Fertilizer (300.000 dong/liter)	55	16,50	47	14,10	49	14,70	15,10
II	Labor cost (3 labors/month /crop)	3	27,00	3	27,00	3	27,00	27,00
III	Fixed cost		33,83		33,83		33,83	33,83
1	Depreciation of equipments ^(3*)		21,83		21,83		21,83	21,83
2	Paying bank interest ^(4*)		12,00		12,00		12,00	12,00
TOTAL (I + II + III)			118,55		108,1		111,59	112,75

Source: Hai Farm and self-calculated data, 2018

Note:

The straight line depreciation method is calculated as follow:

(1) Nursery tray, reused in 3 crops, average cost for nursery trays each cantaloupe crop:*

*(40.000 dong/ tray * 70 trays) /3 crops = 933.333 dong/crop*

(2) PE bag is reused in 3 crops, average cost for PE bag per crop:*

*(4.000 dong/ bag * 3.500 bags)/3 crops = 4.666.666 dong/crop*

(3*) Average depreciation of equipment for each cantaloupe crop (data from Table 2.1):

$$(500.000.000/10 + 30.000.000/5 + 28.500.000/10 + 25.500.000/10 + 20.000.000/10 + 10.000.000/5 + 1.000.000/10)/3 \text{ crops} = 21.830.000 \text{ dong/crop}$$

(4*) Average payable interest for each cantaloupe crop:

$$(500.000.000 \text{ dong} * 7,2\% / \text{year}) / 3 \text{ crops} = 12.000.000 \text{ dong/crop}$$

From the collected data of Hai Farm and self-calculated, it can be seen that total cost of producing cantaloupe in each crop is more than 100 million dong, this is a relatively large cost. Cantaloupe seed source must depend on import sources, causing difficulty in controlling seed quality, affecting quality and productivity. The cost for crop 1 was the highest in the three crops with 118.55 million dong, and the cost for crop 2 was the lowest with 108.10 million dong. In which, the labor cost paid for three people in 3 months will be 27 million dong. The average salary is 3 million dong/ person/ month. The fixed cost for each crop is 33.83 million. The reason for the difference between total costs of materials is the number of seeds, nursery tray, electric, fertilizers, materials used differently in each crop.

4.2.2. Results and production efficiency of Hai farm's cantaloupe

Since the establishment in May 2017, Hai Farm has grown 5 crops cantaloupe with an average output of 3 to 4 tons on an area of 1.500 m² per crop, equivalent to 2.700 to 3.000 fruits, each fruit is heavy from 1,3 to 1,6 kg. The average price of Hai Farm cantaloupe is 60.000 dong/kg.

Table 3: Production results per crop on 1.500 m² in the period of 2017-2018

No.	Indicators	Unit	Crop 1	Crop 2	Crop 3	Average
1	Area	m ²	1.500	1.500	1.500	1.500
2	Number of trees	tree	3.500	2.700	3.000	3.067
3	Output	kg	2.000	3.900	4.300	3.400
4	Yield	kg/m ²	1,33	2,60	2,87	2,27
5	Price	dong/kg	65.000	60.000	75.000	66.67
6	Revenue	million VND	130,00	234,00	322,50	228,83

Source: Hai Farm and self-calculated data, 2018

Looking at the above table, we can see that: The number of tree is different between three crops. The first crop is 3.500 trees and 2.700 trees in crop 2 while 3.000 trees in crop 3 and each tree gives only one fruit. The reason why they change the density is the quality of cantaloupes. At the first crop, they plant too thick and the second crop is too sparse in sensitive. Hai Farm has adjusted the number of cantaloupes planted in the third crop and found that: with this area of 1.500m² will plant maximum 3.000 trees of cantaloupe. If grown like that, the cantaloupes will ensure enough nutrients, space to grow and give the best output and yield.

When cantaloupe is bought at farm, the average retail price is 65.000 dong in crop 1; 60.000 dong in crop 2; and 75.000 dong in crop 3. This difference is explained due to the season of cantaloupe. Crop 1 and 3 is summer and Lunar New Year so that the price of these crops is very high. The highest retail price is 75.000 dong/kg in crop 3. It has brought the high revenue for Hai Farm. Specifically, crop 3 has the highest revenue with 322,5 million dong from selling cantaloupes products. If this result is maintained, Hai Farm can recover capital and quickly gain a profit.

Planting with high technology has less affected by weather factors. Hai Farm is the leader in the successful cantaloupe production in Thua Thien Hue province. With a hi-tech production model, farmers are not required to put much effort, quite idle. Growing cantaloupe brings high income because of low production costs (no pesticides), short time of care, mainly using machine technology, low labor cost. The nature of work is relatively light, creating jobs, stable income for farmers. The application of science and technology does not require too much care techniques and the production team has a lot of experience in applying science and technology.

Economic efficiency is the premise to evaluate the results of production process. It is also the basis for selecting the optimal solution in production and business. The production efficiency of Hai Farm is evaluated through some indicators such as revenue, cost, profit, total revenue/total cost ratio, profit/total cost ratio, profit/total revenue ratio:

Table 4: Cantaloupe production efficiency of Hai Farm on 1,500m² in the period 2017 - 2018

Indicators	Unit	Crop 1	Crop 2	Crop 3	Crop 2/ Crop 1		Crop 3/ Crop 2	
					+/-	%	+/-	%
Revenue	Million VND	130.00	234.00	322.50	104.00	80.00	88.50	37.82
Cost	Million VND	118.55	108.10	111.59	-10.45	-8.81	3.49	3.23
Profit	Million VND	11.45	125.90	210.91	114.45	999.85	85.01	67.52
Total revenue/Total cost	Times	1.10	2.16	2.89	1.07	97.40	0.73	33.51
Profit/Total cost	Times	0.10	1.16	1.89	1.07	1106.17	0.73	62.28
Profit/Total revenue	Times	0.09	0.54	0.65	0.45	511.03	0.12	21.55

Source: Hai Farm and self-calculated data, 2018

We can see that: revenue and profits increased through three crops. For revenue: in the first crop is 130 million dong, the second crop is 234 million, up 80%, the third crop is 322,5 million equivalent to increase 37,82% over the second crop. The profit of the first crop was very low at only 11,45 million dong, in the second crop, profit increased very fast, approximately 999,85% compared to the first crop. The third crop has a profit of 210,91 million, this is the highest profit in 3 crops. It is a good sign of the production potential of Hai Farm and should be maintained in the future.

The total revenue/ total cost ratio tells that if spend one dong of cost will bring about how much dong of revenue. In crop 1, this index is equal to 1,10 means that one dong of cost spent to collect 1,10 dong of revenue, this rate is very low. Meanwhile, in the second and third crop, total revenue/ total cost were 2,16 and 2,89 times which means that one dong of cost spent in crops 2 and 3, revenue would be more than 2 times the amount spent.

Profit/total cost ratio: This indicator shows spend one dong of cost will bring about how much profit. In crop 1, this index is equal to 0,10. It means that you spend one dong of cost will almost have no profit. In crop 2 and crop 3, this index is 1,16 and 1,89 respectively, which means that one dong of cost will create more than 1 dong of profit. This suggests that in the period 2017-2018, the efficiency of the farm's production and business has improved significantly.

Based on the ratio of profit and total revenue show that one dong of revenue will correspond to how much dong of profit. In all three crops, profit/ total revenue ratio is less than 1 which means that one dong of revenue will bring less than 1 dong of profit. However, this indicator has the fast rise trend: 0,09 in crop 1 to 0,65 in crop 3.

4.2.3. Sensitivity analysis of the retail price at Hai Farm

To know the affects of the retail price on profit, we used sensitivity analysis method. Table 2.5 shows the results of sensitivity analysis of profit based on the different retail price for cantaloupe. In

detail, we used five levels of price: 55.000; 60.000; 65.000; 70.000 and 75.000 dong. As expected, the calculations indicate that as the price received for cantaloupe went up, the profit went up.

Table 5: Sensitivity analysis of profit by the cantaloupe price at Hai Farm in the period 2017 - 2018

Profit (million VND)	Price/ kg of cantaloupe (VND)				
	55,000	60,000	65,000	70,000	75,000
Crop 1	-8.55	1.45	11.45	21.45	31.45
Crop 2	106.4	125.9	145.4	164.9	184.4
Crop 3	124.91	146.41	167.91	189.41	210.91

Source: Hai Farm and self-calculated data, 2018

In normal condition, the retail price of Hai Farm cantaloupe is at 60.000 dong. Depend on the festival or holiday, the price will gradually increase. Based on the sensitivity analysis of retail price, we can see that: In the crop 1, if the retail price of cantaloupe is 55.000 dong, profit will be negative and equal to -8,55 million dong. But when the price is large than 60.000 dong the profit will be positive and increase gradually. In the crop 2, the profit increase average 19,5 million dong for each price level. In the crop 3, the profit increase average 21,5 million dong for each price level. It means that hi-tech cantaloupe cantaloupe production will bring the positive benefit for the investors.

4.2.4. Distribution chain of Hai Farm's cantaloupe

Hai Farm has no way of preserving cantaloupe after harvesting. Mainly cantaloupe consumed is fresh, unprocessed. The farm must sell the cantaloupe immediately after harvesting to avoid serious damage. Most of the cantaloupe has ordered by supermarkets and safe vegetable stores. The remaining part is sold for customers who order at the farm because of the limited quantity.

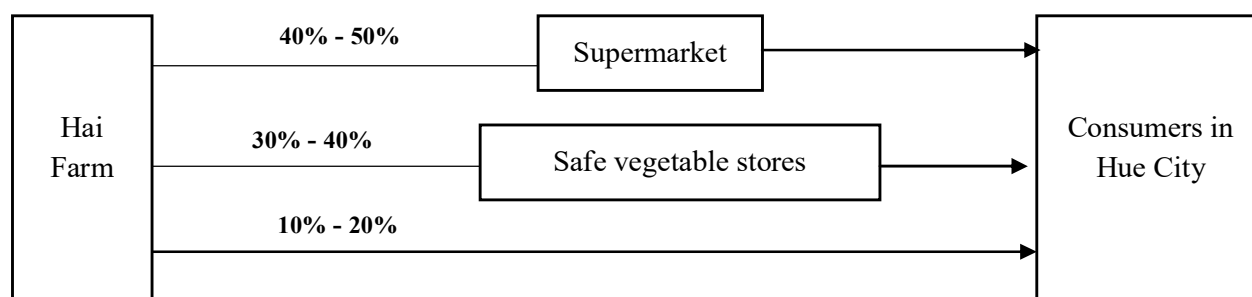


Figure 2: Consumption market of Hai Farm cantaloupe

Source: In-depth interview with Hai Farm manager, 2018

- Direct distribution channel

In this consumption channel, consumers will order via the phone number, fan page or directly to the farm to buy cantaloupe, accounting for 10% to 20% of total cantaloupe. Therefore, consumers get the benefit because they buy the product directly from the producers at low price. The price of cantaloupe does not fluctuate too much per year, on average about 60.000 to 65.000 dong/kg when directly buy at Hai Farm. The price will be higher from 10.000 to 15.000 dong if it is on the holidays. The producers need to meet the demand of retailing at the farm such as visiting preference, witnesses the production process from consumers. On the other hand, directly sales to customers at the farm also increase the reliability of product quality.

- Indirect distribution channel

Hai Farm cantaloupe product is only through a single intermediary element that is the supermarket or safe vegetable stores. This intermediary will order directly at the farm with the large quantity so that

the price usually fixe before harvesting. Due to transportation costs, packaging, depreciation, the price will be higher than directly buy at the farm. However, the supermarkets and stores usually buy a large amount at the wholesale price. Thus, the difference on price between supermarkets, agricultural stores with the retail prices at the farm is not large, in range from 5.000 to 10.000 dong/ kg.

Although Hai Farm cantaloupe is mostly sold in the supermarket (from 40% to 50% of total harvested product) but the main distribution channel that Hai Farm towards is the agricultural product shops channel by many reasons. Firstly, customer's demand for safe and healthy product is increasing which leads to more and more agricultural product shops are established. They are the location where many people trust about quality and safe level. Moreover, the agricultural product shops often sell one product line for one type. If Hai Farm cantaloupe is sold here, there are lower competitive. Secondly, when customers buy the product at shop, they do not take more time to select and pay money. Moreover, the discount of supermarket in general is from 25% to 30% for agricultural products and they have paid for the unreasonable costs. Supermarkets usually have big sale program, it creates the pressure for the supplies. Finally, the products need to meet the requirements of safety certificate, packing, code, invoice, correct quantity,... before appearing in the supermarket.

4.2.5. Consumer evaluation about cantaloupe of Hai Farm

4.2.5.1. Customer demand and habits of using cantaloupe

To have the fully evaluation about Hai Farm cantaloupe, this research interviews 40 customers which is selected by random method at 3 locations: Big C, Hue Viet organic agricultural product shop and Hai Farm. Although the number of respondent is not high, this research already focuses on the mainly markets as refered in the distribution chain. The questionnaire is prepared to collect the characteristics of customers, their demand, and evaluation of Hai Farm cantaloupe. Most of customers show that they know Hai Farm cantaloupe through various media. This is the potential way which promote Hai Farm product to the consumers and expand the business market.

Table 6: Characteristics of customers bought Hai Farm cantaloupe

Demographic characteristics		Frequency (people)	Percent (%)
1. Gender	Male	15	37.5
	Female	25	62.5
2. Age	20 – 35 years old	19	47.5
	36 – 50 years old	14	35.0
	> 50 years old	7	17.5
3. Education	Junior high school	1	2.5
	High school	11	27.5
	College	28	70.0
4. Career	Student	4	10.0
	Public servant	16	40.0
	Private	15	37.5
	Free labor	5	12.5
5. Income	< 5 million dong	9	22.5
	5 - 7 million dong	13	32.5
	> 7 million dong	18	45.0

Source: Survey data, 2018

Looking at the above table, we can see that Hai Farm's customers are mainly female (62,5%), aged between 20 and 50 (for 82,5%) and stable career with high income. More than 97% of respondents who have used the hi-tech agricultural products have high education level (high school, college). Taking care of customer demand and habits is one of the most important factors to maintain and grow enterprise. The result of investigation is expressed in the following table:

Table 7. Customer's demand for Hai Farm cantaloupe

Criteria		Frequency (people)	Percentage (%)
1. Frequency	1-2 times/ week	4	10
	1-2 times/ month	15	37.5
	Less than 1-2 times/ month	21	52.5
2. Interested factors	Quality	40	100
	Price	34	85
	Brand	24	60
3. Potential for buying in the future	Can not buy anymore	8	20
	Buy as normal	22	55
	Increasing	10	25

Source: Survey data, 2018

With 40 interviewees, there are 52,5% of them using cantaloupe less than 1-2 times per month. It means that they use very little, sometimes not using, or using irregular frequency. All consumers care about the quality, accounted 100% of people interviewed. Besides quality, the price is a factor that customers interest. With 85% of respondent, the price is the factor has the importance role when customers purchase commodities. Consumers are always looking for affordable cantaloupe, safety and high nutritional value. Brand factor also gives customers a peace of mind when choosing the product. The brand contributes 60% to the decision to use cantaloupe of customers.

The survey results show that 55% of customers think that they will continue to buy the Hai Farm cantaloupe as usual, 25% of them will continue to use it more in the future. This number indicates that the quality of Hai Farm cantaloupe has satisfied customers, making them trust and continue to use it for the long term. It shows the success in the production and promotion of brand Hai Farm cantaloupe in the market.

4.2.5.2. Customer's evaluation about cantaloupe of Hai Farm

The cost of producing cantaloupe is high so that Hai Farm needs to pay attention to quality and the acceptability of consumers. Quality and price need to balance which make customers feel pleasure with high-quality product. Thus, it will increase the number of loyal customers. Taking care of the opinions as well as the evaluation of customers to improve the quality and product price is very necessary.

In general, the average valuation level of customers is more than 4 which means that the customers are completely trust for the quality, safety standard, and the form of Hai Farm cantaloupe. Specifically, the evaluations for the reliable quality; no trace of pest; the quality of the products are good and sweet, and the customers evaluated average in the range from 4 to 5 and the average is 4.6 and even higher. The price is high but the customers trust the safety and quality of the product. The result of this investigation is shown by the following table:

Table 8: Customer's evaluation about Hai Farm cantaloupe

No.	Characteristics	Min	Max	Mean	Percentage (%)
I	Reliability of cantaloupe in Hai Farm				
1	Hai Farm's cantaloupe has the reliable quality	4	5	4,7	94,0
2	Hai Farm's cantaloupe meet safety standards, do not use pesticides	3	5	4,4	88,0
3	Hai Farm's cantaloupe has the position in the hi-tech production market	3	5	4,5	90,0
II	Cantaloupe form of Hai Farm				
4	No tracing of diseases	4	5	4,6	92,0
5	Fresh cantaloupe, eye-catching shape	3	5	4,5	90,0
6	Smooth and thinner than the normal cantaloupe	3	5	4,1	82,0
7	The shape is larger than normal cantaloupe	3	5	4,1	82,0
8	Hai Farm's cantaloupe has a good taste and sweet	4	5	4,7	94,0
III	Cantaloupe price of Hai Farm				
9	Cantaloupe price of Hai Farm is suitable with customer's income in Hue city	2	4	3,3	82,5
10	Cantaloupe price of Hai Farm is commensurate with the quality of product	3	5	4,3	86,0

Source: Survey data, 2018

** Note: 1-Totally disagree; 2-Disagree; 3-Neutral; 4- Agree; 5- Totally agree*

From the evaluation of 40 customers using Hai Farm cantaloupe, we can be confident that most customers are satisfied with the quality and the price. It proves that Hai Farm's cantaloupe ensures the quality and standards to become a key agricultural product of Hue and can compete with other hi-tech products in the market.

5. Conclusion and policy implication

Hi-tech farm use the biotechnology in disease testing and biological products for agriculture (such as soil improvement, fertilizers, pest and disease treatment) and environmental treatment (microorganisms, algae...). By ensuring the best habitat for plants, we can grow to give the best quality products without pests. This research clarifies the economic efficiency of hi-tech cantaloupe production in Hai Farm. With 1.500 m² total area, farm has increased their revenue and profit through three crops. At the first crop, the profit is only 11,45 million dong. Until the second crop, this result has changed to 125,9 million dong, and received the best result in the third crop, with 210,91 million dong. This is a good indication of Hai Farm's cantaloupe when they change the density of crop. This research also conducts the sensitivity analysis of profit when the retail price of cantaloupe is from 55.000 dong to 75.000 dong. When price level is changed, the profit has a large change and still positive.

Moreover, the customers are completely trust for the quality, safety standard, and the form of Hai Farm cantaloupe. Producing hi-tech cantaloupe is a new product, so it is necessary to increase marketing activities to attract more consumers to know the products. From there, finding new potential markets such as restaurants, safe agricultural shop,... which create more opportunities for Hai Farm. Developing the products based on large distribution chain such as Big C, Co.op mart,... to reach closer to consumers. Hai

Farm needs long-term cooperation with retailers. Moreover, it is necessary to have full bills, certificates of safe products as well as beautiful packaging, ensuring stable product quality.

Futhermore, establishing the information channels such as website, fan page,... to update price, type of cantaloupe and allocation of supermarkets which selling products to help the consumer buy products easily. Through these activities such as trade fairs, advertising or sponsorship promote Hai Farm brand to consumers. In addition, Hai Farm not only focuses on researching the best markets for cantaloupe products in Hue city but also in neighboring provinces and the whole country.

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