

CHALLENGES AND SOLUTIONS FOR VIETNAM TO PRODUCE GOOD AGRO-PROCESSED FOODS - FOCUSING ON RICE PRODUCTION IN THE MEKONG DELTA

NHỮNG THÁCH THỨC VÀ GIẢI PHÁP CHO VIỆT NAM ĐỂ SẢN XUẤT THỰC PHẨM CHẾ BIẾN NÔNG SẢN CHẤT LƯỢNG CAO - TẬP TRUNG VÀO SẢN XUẤT LÚA GẠO Ở ĐỒNG BẰNG SÔNG CỬU LONG

Ki Yull Yu

NIPA Advisor, Korea-Vietnam Incubator Park, Can Tho, Vietnam

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ABSTRACT

Survey results from September 2017 to June 2018 revealed that the processed food in the Mekong Delta was below the consumer's desire level. Some of the causes were the facts that raw materials for processing were not hygienic, and that the quality was low. The main others were cultivation environment pollution, the inferior seeds, cultivation techniques and post-harvest management. The solutions to these challenges are to make surrounding farmland cleaned, to expand the certified seeds' supply and the advanced new farming technology, to modernize facilities for drying, storage and sort of agro-products, and to improve logistics capacity. These countermeasures will reduce environment pollution and enhance the quality and safety of both agricultural products and the processed foods in Mekong Delta, which will contribute to improve people health. I hope that researches on technology, facilities and professional manpower for agricultural processing as well as on soil and water quality will be done.

Keywords: *Raw materials; Agro-processed foods; Certified seed; Advanced farming technology; Environment pollution.*

TÓM TẮT

Kết quả khảo sát từ tháng 9 năm 2017 đến tháng 6 năm 2018 cho thấy thực phẩm chế biến ở Đồng bằng Sông Cửu Long (ĐBSCL) có mức cung thấp hơn mức cầu của người tiêu dùng. Thực tế cho thấy có một số nguyên nhân do nguyên liệu chế biến không hợp vệ sinh và chất lượng thấp. Tuy nhiên, nguyên nhân chính là do môi trường canh tác bị ô nhiễm, hạt giống kém chất lượng, kỹ thuật canh tác và quản lý sau thu hoạch chưa tốt. Các giải pháp cho những thách thức này là làm sạch đất nông nghiệp xung quanh, mở rộng các nguồn cung cấp hạt giống được chứng nhận và công nghệ canh tác mới tiên tiến. Hiện đại hóa các cơ sở sấy, tồn trữ và phân loại nông sản, cũng như cải thiện kỹ năng xử lý sau thu hoạch. Những biện pháp đối phó này sẽ giảm thiểu ô nhiễm môi trường và nâng cao chất lượng và an toàn của cả thực phẩm nông sản và thực phẩm chế biến ở ĐBSCL, nó cũng sẽ góp phần cải thiện sức khỏe con người. Tôi hy vọng rằng các nghiên cứu về công nghệ, cơ sở vật chất và nhân lực chuyên nghiệp cho chế biến nông sản cũng như chất lượng đất và nước sẽ được thực hiện.

Từ khóa: *Nguyên liệu; thực phẩm chế biến nông sản; hạt giống được chứng nhận; công nghệ canh tác tiên tiến; Ô nhiễm môi trường.*

1. INTRODUCTION

The Mekong Delta is a treasure storehouse of agricultural products. The

average annual temperature is 22~30°C [1]. It is convenient to use agricultural water because of Mekong River and its many tributaries. The land is also fertile with

alluvial soil, and the labor force is sufficient. So, cheap and abundant agricultural products are produced all year round. As a result, 25,598.2 thousand tons (16.7million tons in milled rice) of paddy rice was produced in Mekong Delta in 2015, which was 56.8% of Vietnam's total production of 45,105.5 thousand tons (29.4million tons in milled rice) [2-3]. This 16.7million tons in milled rice is about 4times as much as the annual 4.3million tons produced in Korea [2].

Tropical fruits such as mangoes and bananas have also produced a lot in Mekong Delta. But production statistics were not available, so the production by each fruits here could not be known.

However, export price of Vietnamese rice in 2017 was FOB \$355~360/ton, which was 8.2~8.3% less than FOB \$387~392/ton of rice produced in Thailand [4]. Agricultural processed foods made from these raw materials also did not satisfy consumers' needs.

One of the many questions I have received since coming to Vietnam in August 2017 was why export prices of rice produced in the Mekong Delta are lower than them produced in Thailand, and why the processed foods here are of less quality than those in developed countries. So, I surveyed and studied this matter, and suggest the causes and solutions obtained from the survey on agricultural products, especially rice production to answer these questions. Survey on agricultural products processing facilities & technology, and professional manpower, which are closely related to the quality of agricultural processed food, were not done because the conditions were not available.

2. MATERIALS AND METHODS

Vietnam is a large country with length of 1,700 km South to North and area of 339,669 km² [3]. On the other hand, my activity radius is mainly limited to the Mekong Delta, and it is impossible to investigate the whole country due to time, budget and the weak public transportation, and so on. So my survey was

generally covered to the Mekong Delta. The survey period ranged from September, 2017 to June, 2018. The method was to visit government agencies, rural villages, markets, marts, food exhibitions, and to have interviews with government officials, farmers, consumers, and general peoples. The actual survey-areas are Can Tho, Hau Ziang, An Giang, Bac Lieu, Vinh Long, Soc Trang and Ho Chi Minh.

I also referred to institutions & organizations' websites and newspapers. I made the survey questionnaire, but I could not do it because the situation was not good enough.

3. RESULTS AND DISCUSSION

3.1 Why Mekong Delta's agro-processed foods do not meet consumers' needs

Agro-processed food produced in Mekong Delta did not meet consumers' desires. The consumers at marts said that the processed food quality is not better than those of Korea and Japan including taste, coloring, packaging and so on.

The reasons were that the agricultural raw materials are not good, that the food processing technology and facilities are not advanced, and the food processing professionals are lacking.

However, processing technology, facilities, and professional manpower were beyond my capacity in investigation due to time-budget lack. There were insufficient data and information to find out their solutions. Therefore, I proposed only the solutions on the weakness of the agricultural raw materials investigated.

3.2 Challenges and Solutions for Poor Agricultural Products

Agricultural products used as raw materials for processing should be good in order to produce good agro-processed foods. However, survey results showed that agricultural products produced in the Mekong Delta were generally not good in the quality and not clean in hygiene.

3.2.1 The agricultural production environment

The water used to produce crops was not clean. In addition, rivers, streams, waterways and surrounding farms were flooded with garbage.



Fig.1. Hau riverside dirty with trash like plastic (Photo: KI YULL YU, June 2018)

The water used for washing agricultural products was also not hygienic and the washing itself was not sufficient. I did not feel the need to discuss the cleanliness of agricultural products with measurement data. Even if the agricultural products were promoted to be clean on the base of analysis data, it was unlikely that many consumers will get a good impression about both agricultural materials and the processed food produced in this environment.

First of all, it is necessary to clean the cultivation environment by removing visible plastic and styrofoam waste surrounding rivers, streams and farmlands. It is also a good idea to install garbage cans or garbage places in entertainment areas where many people gather. In mid-to-long term plan, river and water-drainage facilities, soil & water quality should be improved. These measures will make the agricultural products in the Mekong Delta cleaner than they are now.

Although it may seem like a small job to remove plastic, plastic contamination should be avoided, not only for the production of clean agricultural products, but also for a healthy earth. Now, we need to pay attention

to 'Five things you can do to end plastic pollution' being driven by the World Bank [5].

3.2.2 The quality of agricultural products

Agricultural products were inferior in the quality. They are not only clean but also of low quality. Their size, shape, color, and degree of ripeness were not uniform. The reasons were that seeds were not excellent, and that the cultivation technique was not advanced, and that the post-harvest management was neglected. I wanted to investigate the nutrients and the taste. But the data on this was insufficient and the conditions were not accepted, so I could not handle with the matter here.

3.2.2.1 Seeds used by farmers

The seeds used by farmers were not excellent. They are mostly ordinary seeds and self-produced seeds, which were not the certified seeds or the seeds equivalent to the certified seeds. If the seeds are not excellent, the yield and the quality are poor. In addition, they had a high incidence of undesirable variety, low germination rate, and non-uniformity. Their degree of degradation was too severe. So, quality of the products obtained from the seed was inevitably bad because of the severe pest-damage and natural disasters.

For this reason, developed countries invest much of their budget and manpower in breeding and supplying good seeds of crops. In Korea, the certified seeds of the five major food crops of rice, barley, corn, soybean, and potato are produced by the government and supplied to farmers. Other seeds, which are also equivalent to the certified seeds, are produced and sold by private seed companies. In the case of rice, the certified seeds supplied every year are more than 30% of total seed demand. Farmers purchase and plant new seeds of good quality at least once every three years. Table 1 shows rice seed inspection standard by growing stages in Korea [6].

Breeding program was not active, and new varieties were not various in the case of mangoes, which were produced in the

Mekong Delta. For example, apple mangoes were rarely cultivated, which were produced many in Cambodia. Therefore, it is essential to strengthen the high quality breeding

programs, and to expand supply of the certified seeds of the major crops as rice and mango in the Mekong Delta.

Table1. Rice seed inspection criteria in Korea

	Least limit (%)		Maximum limit (%)										
	a	b	c	d	e	Weed seed			h	Infected		k	l
						f	g	sum		i	j		
FS	99.0	85.0	14.0	0.02	0.02	none	0.03	0.05	2.0	2.0	5.0	1.0	0.2
RS	99.0	85.0	14.0	0.05	0.03	none	0.10	0.10	3.0	5.0	10.0	1.0	0.4
CS	98.0	85.0	14.0	0.10	0.05	0.00	0.10	0.20	3.0	5.0	10.0	2.0	0.6

a. Seed purity(Excluding seed of off-type and weed and other materials.)

b. Germination rate, c. Moisture content, d. Contamination of other variety seed,

e. Contamination of off-type seed,

f. Barnyard millet,

g. Other dangerous weed seed,

h. Damaged seed like broken,

i. Gibberella fujikuroi,

j. Other disease infected seed,

k. Other materials,

l. Non-glutinous rice contamination in case of glutinous rice,

FS: Foundation seed, RS: Registered seed, CS: Certified seed

3.2.2.2 The cultivation techniques

The cultivation methods done by farmers in the Mekong Delta were the traditional ways of descent. Cultivation techniques were not advanced.

The spaces between a plant and a plant were not fixed, and the bagging of fruits was rare at the mango orchards. The basic field management such as weeding and pest control had not been well done.

Direct seeding was almost done while transplanting was not seen at the rice cultivation. In the case of direct seeding, the broadcasting (Scattering) was above 99%

while the drilling was rare and the dibbling was none. On the other hand, transplanting is 96.6% and direct seeding 3.4% in rice cultivation of Korea [7]. In case of rice direct seeding, there is no broadcasting, both drilling and dibbling are all done by the machines.

In addition, rice standard farming manual including sowing, transplanting, direct seeding, fertilization, weeding, pest control and water management was well established in Korea. Furthermore, the RDA and its affiliates provide farming schedule with the farmers on a weekly basis through broadcasting, newspapers, and the Internet. Occasionally, the rural extension officers visit

farmers to transfer them new advanced farming-technology. For example, the Rural Development Administration in Korea provided “Weekly Agricultural Information” on crops, and the activities from May to June 2018 were shown in Table 2 [8].

Table 2. *Weekly Farming Information (May to June 2018)*

No	Title	Manager	Date	Views	Attachment
441	WFI No.24(10.06~16.06.2018)	C.S Kim	05-06-2018	257	HWP
440	WFI No.23(03.06~09.06.2018)	C.S Kim	30-05-2018	1,194	HWP
439	WFI No.22(27.05~02.06.2018)	C.S Kim	23-05-2018	1,695	HWP
438	WFI No.21(20.05~26.05.2018)	C.S Kim	16-05-2018	1,465	HWP
437	WFI No.20(13.05~19.05.2018)	C.S Kim	09-05-2018	1,490	HWP
436	WFI No.19(06.05~12.05.2018)	C.S Kim	02-05-2018	1,524	HWP

Source: Rural Development Administration of Korea

However, seen was no standard agricultural booklets in the Mekong Delta. Farming skills and its information also were not systematically communicated to farmers. In order to improve the quality of agricultural raw materials produced in Mekong Delta, it is essential to regularly inform farmers of information on agricultural activities by each crop season with the establishment of farming system and standard farming technology of the major crops like rice and mango. New advanced farming techniques should be stretched out farmers through education and training. As well as rice harvesting on time, seeding by agricultural machines should be also hastened.

3.2.2.3 Post-harvest management

Management of agricultural products after harvest is as important as cultivation to improve the quality of agricultural products. However, there were not enough drying and storage facilities for agricultural products in the Mekong Delta, and the logistics facilities were not satisfactory. This resulted in low quality following deterioration of agricultural products after harvest.

The good post-harvest management is like the second production and is also important for quality improvement. This is

why the developed countries such as Korea and USA have modernized and expanded the drying, storage and transportation facilities for agricultural products. In Korea, the harvested paddy rice is immediately transported to rice processing complex (RPC) of Nonghyup (National Agricultural Cooperative Federation) at counties. Depending on the moisture content of paddy rice, rice less than 15% is stored in the storage facility, and rice with moisture content of 16% or more will be dried generally by hot air. Storage facilities are mainly grain warehouses and silos. Long-term storage of rice is strictly controlled by adjusting temperature and humidity and by fumigation.

Therefore, in order to improve the quality of agricultural products in the Mekong Delta, it is also necessary to modernize and expand the facilities for drying and storage of grains, washing-sorting and low temperature storing of fruit & vegetables. Infrastructure such roads and harbors should be also improved so that logistics can be done smoothly

4. CONCLUSION

Some of the reasons why agricultural processed foods produced in the Mekong Delta did not meet consumers’ needs were that the agricultural raw materials were not hygienic, and that their quality was low..

The unsanitary agricultural products were caused by the contamination of the rivers, streams and waterways as well as farmlands with plastic and other garbage. The low quality of agricultural products was due to the facts that the used seeds were not excellent, the cultivation techniques of crops were not advanced, and the management of harvested products was insufficient.

The solutions to these problems and/or challenges are as follows; First, to clean the cultivation environment by removing waste around rivers and farmland with their maintenance. Second, breeding new quality variety, variety diversification, increasing of certified seed's supply, establishment of standard farming manual by each crops, providing farmers with farming schedule periodically, improving the cultivation technology, and hastening agri - mechanization for sowing. Third, to modernize and expand the facilities for

drying, processing and storage of grains including the facilities for cleaning, sorting and low-temperature storage of fruit & vegetables. Fourth logistics should be flown smoothly through improvement of roads, harbors and transportation facilities.

These measures will decline environment pollution and enhance the quality and safety of agricultural products and the processed foods, which will also contribute to improving people's health. It is hoped that survey-research on technology, facilities and professional human resources for agricultural processing that had not been done this time should be done.

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Corresponding author:

PhD. Ki Yull YU

NIPA Advisor, Korea-Vietnam Incubator Park (KVIP), Can Tho, Vietnam

E-mail: yukiyull@hanmail.net