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DEVELOPMENT OF HEALTHY FOOD RECIPES FROM LOCAL WISDOM WITH AN ENVIRONMENTALLY CONSERVATIVE PROCESS TO PROMOTE GASTRONOMY TOURISM

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Abstract

This research aimed to study food wisdom and develop healthy food recipes from local wisdom using the environmentally conservative process to promote gastronomy tourism in Ko Koet Community, Ayutthaya Province. The mixed research method was applied using the participatory action and experimental research approaches. Two healthy food recipes to promote gastronomy tourism in Ko Koet Community, Ayutthaya Province were Tom Yum Kung Maenam and Kang Liang Kung, which were the identity of the region. Both recipes were healthy food initiated from local wisdom with the environmentally conservative process accepted by consumers. The level of acceptance was moderate to high. Analysis results indicated that nutritive value of Tom Yum Kung Maenam included 6.81% of protein, 2.46% of carbohydrate, 0.80% of fat, and 0.24% of fiber. Meanwhile, the nutritional value of Kang Liang Kung contained 10.54% of protein, 5.49% of carbohydrates, 1.34% of fat, and 1.54% of fiber. Both menus were healthy food with a nutritional balance created based on local wisdom using the environmentally conservative process and appropriate for promoting the gastronomy tourism of Ko Koet Community, Ayutthaya Province.

Keywords: Healthy Food Recipe, Local Wisdom, Environmental Conservation, Gastronomy Tourism, Ayutthaya Province

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Introduction

Presently, there are more and more campaigns to encourage consumers to be interested in nutritional food, particularly Thai food from Thai ancestors' local wisdom that is full of nutrients and medical properties from herbal vegetables. Ingredients of Thai food are local vegetables, spices, and seasonal fruits. Some local vegetables and plant synthetics contain medical properties that are good for health.

The research by Kosulwat et al. (2005) revealed that the quantity and benefits of phytochemicals in Thai food, which are the chemical compounds produced by plants and contain medical properties, were varied and had important roles in disease prevention and treatment, such as cardiovascular disease, hypertension, hyperlipidemia, diabetes, and some types of cancer. For this reason, Thai food has a high potential for healthy food that improves health or minimizes the risk of diseases. Aside from the essential nutritional function, Thai food has a balance nutritive value that is appropriate for the body's demands. Thai food is varied, mainly natural, and some meat, usually fish, and low fat. Thus, Thai food has a characteristic of healthy food, which is consistent with the accurate consumption principle; to consume food that is balanced with the demand of the body to receive the proportional carbohydrate, protein, and fat, and sufficient vitamins, minerals, and fibers. Thai food consists the energy and nutrients proportionally with high fibers, vitamins, and minerals from ingredients. The side dishes, which mostly are local seasonal vegetables, are varied. Herbal vegetables are used as ingredients, side dishes, curry paste, or cooked directly. Further, Thai food is an herbal-balance food that Thai people in different regions apply their local wisdom to create, adapt, and flavor the local resources to become Thai food that is very unique in components, raw materials, ingredients, and spice. Thai herbs are Thai wisdom and gastronomy heritage that should be carried on (Anuntatanachai et al., 2010; Suanpang et al., 2022; Jainan et al., 2022).

Gastronomy tourism is one of the tourism leads to the change in tourism marketing worldwide (Koograsang et al., 2019). Tourists prioritize tourism to promote gastronomy tourism, which is currently driven by the growth of technology. Online media is one of the crucial factors in promoting gastronomy tourism by facilitating tourists to search for information. Gastronomy tourism in each region is different based on culture and raw materials in regions, so the tastes are distinguished. Therefore, the uniqueness of Thai food makes it popular among foreign tourists who come to try and learn about Thai cooking, and it helps to promote tourism. Activities are various, from selecting homegrown vegetables, and providing knowledge about raw materials and Thai herbs properties, to cooking. Consequently, it generates income for Thailand (Suanpang et al., 2022; Jainan et al., 2022).

The activity development process of creative gastronomy tourism is to classify the quantitative knowledge from the tourist's behavior and demands based on the demand and gastronomy tourism behavior into three categories: Gastronomes, Foodie, and Optimizer. The analysis of all groups of tourists leads to the determination of the gastronomy tourism route. Tourists have a chance to taste Thai rare ancient food cooked with local raw materials, such as Kang Ngao Ngod, Srang Wa, Kung Maenam, Pla Maenam, Kang Runjuan, Khanom Hin Fon Thong, or Khanom in Thong's family, that are arranged and served delicately in a beautiful container to present the original savor since Ayutthaya period (Sopa et al., 2022; Suanpang et al., 2022; Jainan et al., 2022).

The significance of the development of healthy food development from local wisdom with the environmentally conservative process (Green Gastronomy& Low-carbon) not only strengthens the consumer's health but also considerably promotes the gastronomy tourism of Thailand. For this reason, it is essential to improve and develop Thai food nutrients to become potential for healthy food, have more nutritive balance from local herbs, be safe and present its contemporary and cultural qualities toward international food.

Research questions were developed from the synthesis of Ayutthaya gastronomy tourism to study Ko Koet demands. Results showed that it lacked the synthesis of healthy food wisdom from local wisdom, the development of healthy food recipes from local wisdom using the environmentally conservative process (Green Gastronomy & Low-carbon) to promote gastronomy tourism in Ko Koet. From the research gap and review of demands, the research on “Development of Healthy Food Recipes from Local Wisdom with Environmentally Conservative Process (Green Gastronomy & Low-carbon) To Promote Ayutthaya Gastronomy Tourism” was conducted for the beneficial results in terms of the health of community members and tourists, income generation to community, and gastronomy tourism provision. Therefore, this research has the following objectives: 1) Study the healthy food wisdom from local wisdom in Ko Koet Community, Bang Pa-in District, Ayutthaya. 2) Develop healthy food recipes from local wisdom with the environmentally conservative process (Green Gastronomy & Low-carbon) to promote the gastronomy tourism of Ko Koet Community, Bang Pa-in District, Ayutthaya. 3) Analyze the nutritive value of healthy food recipes from local wisdom with the environmentally conservative process (Green Gastronomy & Low-carbon) that promotes health.

Literature Review

Healthy Food Recipes from Local Wisdom

The Eleventh National Economic and Social Development Plan (2012-2016) set the strengthening strategies for food and energy by having the development guideline and promoting the value added to the agricultural food and energy based on local wisdom and biodiversity to create product identities, such as herbs, healthy food and services, etc. Therefore, local wisdom is a system of knowledge, beliefs, and ideas of local people in management that reflects their way of life, which is different in each culture and society, integrated and inherited from the ancestors. Phongpit (1986) stated that local wisdom is knowledge acquired from learning, accumulation, and inheritance. It is the life experience of local people. Local wisdom is classified into two types: abstract local wisdom, including vision, life view, philosophy, and lifestyle, and substantial local wisdom, including arts and cultures, agricultural objects, music, etc.

Food is a vital tool for accessing culture and represents the identity and local culture via food and tourism Du Rand et al. (2003). Each region has its unique gastronomy culture derived from the self-adjustment and natural modification of the community members to highly utilize the natural resources, access raw materials and food resources, and production wisdom. All aspects connect as one process indicating the intelligence of humans in terms of creativity, application, and implementation. It is an accumulated experience passed on from the ancestors and finally becomes food identity. Local gastronomy culture reveals lifestyle, social context, and wisdom via the living, food beliefs, consumption behavior, and health of community members Tansakul (2020). Survey results of knowledge about local food presented nine factors affecting local food identity raw materials were local resources, cooking methods, eating methods, topography, weather, relocation, technological advancement, family and social changes, and relationship construction with foreign countries.

Gastronomy Tourism

Concepts of gastronomy tourism: Gastronomy tourism is the experience of traveling to many locations where food festivals, food exhibitions and demonstrations, food tasting, or food activities are organized, particularly those concerning local food which plays an important role in social learning since it encourages people to learn and gain new experiences. Consequently, they travel to sources of food production and distribution, which finally becomes a new pattern called gastronomy tourism. From the significance of local food, the government of many countries advocates the development of local food as a tourism product to interest tourists and

develop the region and communities to be tourist site, and to promote and generate income for the community, which leads to the employment, development of the community, and upgrade the economy sustainably (Gheorghe et al., 2014; Gogoski & Cuculeski, 2019). To promote and highlight local food to be widely recognized, promotion and gastronomy tourism is needed. Local food may be modified to fulfill the taste of tourists, especially foreign tourists. At the same time, cultural exchange is possible; the region might have been influenced by food from tourists and adapt it to their culture or original savor. At present, “food” is considered the representative that introduces the lifestyle of people in the community to society Singsomboon (2014). Public relations of gastronomy tourist sites, which is to develop the gastronomy tourist sites using food, must base on the inclusive and explicit understanding of the local region in order to successfully and efficiently adapt local food to upgrade the region to be the destination of gastronomy tourism. The key to the success of food tourism destinations (and gastronomy tourism) is to understand the factors creating the differences and unique identity from other tourist sites. The gastronomy tourism would derive from local resources, such as cultures, history, topography, or the weather that offered different experiences from other regions to tourists, so they visited the region. Therefore, understanding food identity and creating a perception of such identity is necessary for using food to develop tourism. Thus, it is concluded that local food is the intangible cultural capital in the region, and the success of the development of tourist sites using local food depends on the understanding of the identity of local food and the recognition of tourists. It fosters the awareness of local culture, which is a component of marketing promotion, in particular, the food sensation and taste enhance the experience of tourists combining the local culture, hospitality, and local uniqueness, especially food tasting and cooking learning adds value to their experience (Klinjandang & Dabphet, 2020). Ayutthaya gastronomy tourism aimed to upgrade the gastronomy product, integrate information from tourism activities selection and spatial data context, select the connecting tourist sites, and study the gastronomy tourist sites to set the outstanding activities, such as cruising and tasting Sri Ayothaya food where the developed recipes are served with the story-telling about ethnic groups in Ayutthaya period and “Thai Desert Work Shop” at Aunty Mali’s house at Ko Rian to support gastronomy tourists, and upgrade Ko Rian community to be the museum or Ayutthaya gastronomy learning center (Co-kitchen).

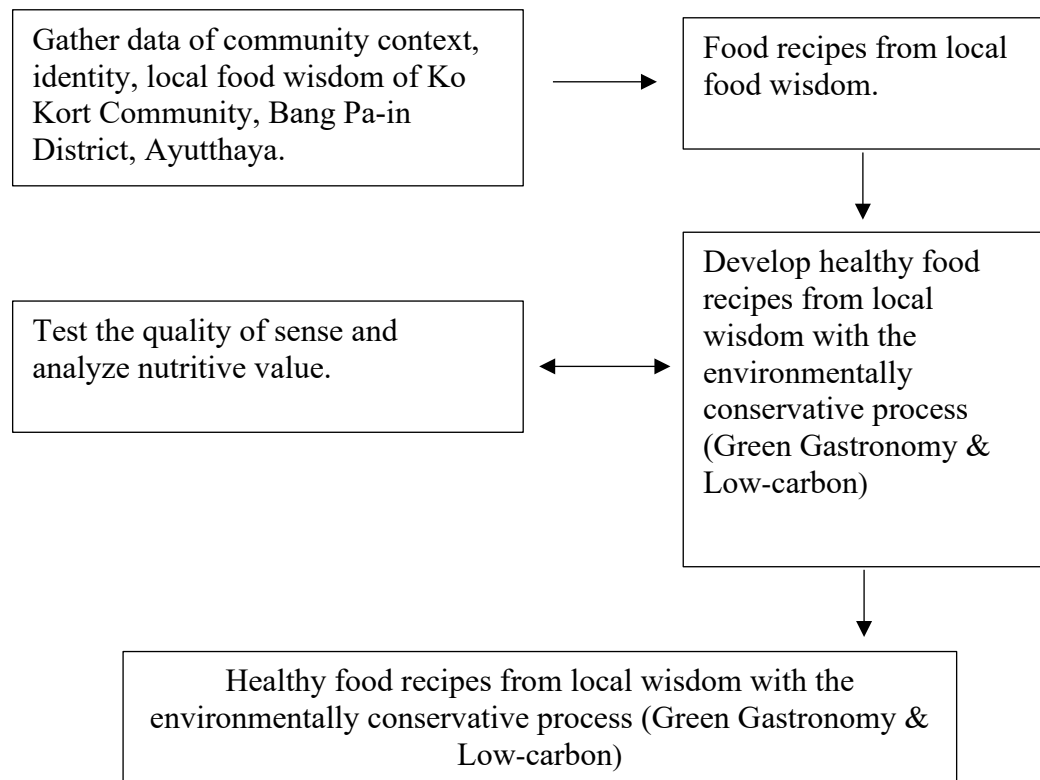
Community-based Tourism (CBT): Community-based tourism has a positive and negative impact on the community. Good and efficient planning and management lead to income, occupation, and business opportunity that results in a better quality of life for the community members, as well as the natural, historic site, history, and traditions conservation. Moreover, community-based tourism is a part of sustainable tourism, which is cultural tourism focusing on the significance of natural and environmental management, and the use of tourism to develop the community. There are four key components of community-based tourism. First, the personnel potential which the community members know themselves very well and are ready to cooperate with all sectors under unity, learning, and open-mind. Second, the potential of the region, which is the natural resources, cultures, traditions, and local wisdom that is managed appropriately for the worth and sustainability of natural resources. Third, the management to become the community with a vision to understand community-based tourism, has a leader who is accepted, has the direction and preparation to cooperate with the government sector and relevant networks, and organizes the appropriate tourism pattern for the community. Last, the participation expresses opinions, problem-solving, encouragement of participation, and problem-solving based on the researcher or local philosopher’s experience.

Healthy Food (Green & Low Carbon)

Healthy food is food with nutritional standards and appropriate energy and nutrition for health. The four crucial qualities are 1) Adequate energy and nutrition to the body, 2) Balanced nutrition, 3) Moderate volume to the body demand, and 4) Varied types of food. Laurujisawat

(2013) defined that healthy food could be for the broad market and a specific target group. As for the specific definition, it was varied, but in short, it referred to the consumers who focused on good health and long live. Thus, they needed to maintain a food balance and non-disease that affected good mental health. Consumers connected food consumption and health together; for instance, some consumers believed that good food affected good physical and mental health. On the other hand, incorrect consumption resulted in some diseases, such as diabetes, hypertension, heart disease, and paralysis. Balanced nutrition healthy food is food that gives energy that balances with the used energy, non-saturated or trans fatty acid food, and less sweet and salty food. Consumers should consume a variety of food with more vegetables, fruits, and grains.

Research Framework



Research Methodology

This mixed methods research included the participatory action research approach. The community took part in the learning, problem determination, creating development guidelines, which was the community resolution, and accepting the development outcome. The research methodology was as follows.

Study the community context and identity, local food wisdom, and inheritance of local food wisdom in Ko Koet Community, Bang Pa-in District, Ayutthaya. Data on healthy food recipes from local food wisdom were collected from in-depth interviews, structured interviews, and interviews with 12 healthy food experts in Ko Koet Community, Bang Pa-in District, Ayutthaya selected from the purposive sampling method, the participatory observation of healthy food cooking, and documents and relevant studies. A group of experts in healthy food in Ko Koet Community and food scholars summarized, analyzed, and selected healthy food recipes from local wisdom with the environmentally conservative process (Green Gastronomy & Low-carbon) to promote Ayutthaya gastronomy tourism at Ko Koet Community, Bang Pa-in District, Ayutthaya.

Develop healthy food recipes from local wisdom with the environmentally conservative process (Green Gastronomy & Low-carbon) to promote Ayutthaya gastronomy tourism at Ko Koet Community, Bang Pa-in District, Ayutthaya. Two selected recipes from the first step were developed to get the standard by measuring ingredients, ensuring the hygienic cooking process, and evaluating the acceptance of recipes with the sensory evaluation method. Evaluate the preference for the overall quality using the 9-Point Hedonic Scale evaluation form with 50 evaluators, who tasted both recipes and filled out the acceptance score.

Analysis of Nutritive Value of Both Healthy Food Recipes

1. Moisture content analysis (Association of Official Analytical Chemists, 2000)

1.1 Cook the moisture can and lid in the electric oven at $100 \pm 2^\circ\text{C}$ for 30 minutes. Weigh (W_1) 5g. of the sample, put it into the cooked moisture can and weigh (W_2).

1.2 Cook the moisture can that the lid was opened in the electric oven at $100 \pm 2^\circ\text{C}$ for 3 hours.

1.3 Remove the moisture can from the electric oven and close the lid immediately. Set it cold in the desiccator for 30 minutes, and weigh.

1.4 Cook for one hour to get the permanent weight (permanent weight means the difference between both weights should be less than 2 mg.) (W_3).

$$\text{Moisture volume (\% of weight)} = \frac{(W_2 - W_3)}{(W_2 - W_1)} \times 100$$

where W_1 = weight of the moisture can (g.)

W_2 = weight of the moisture can and sample before cook (g.)

W_3 = weight of the moisture can and sample after cook (g.)

2. Fat content analysis (Sohxlet extract method) (Association of Official Analytical Chemists, 2000)

2.1 Weigh the cooked sample with the permanent weight (0.5-1.0 gram) (W_1).

2.2 Transfer the sample into the fat-extracted filter. Wrap and put it into the timber.

2.3 Put the timber in a sohxlet extraction kit.

2.4 Add 160 ml. of petroleum ether into the 250 ml. round bottle flask that is cooked and weighed (W_2).

2.5 Turn on the coolant machine at 10°C for 30 minutes before extraction. Turn on the heating mantle at level 4-5 and extract fat at the appropriate time with fat content in the sample.

2.6 Turn off the heating mantle and evaporate petroleum ether from the sample in the hood.

2.7 Cook the round bottom flask in the electric oven at $102 \pm 2^\circ\text{C}$ for 2 hours, cool it in the desiccator, and weigh it (W_3).

$$\text{Fat volume (\% of weight)} = \frac{(W_3 - W_2)}{W_1} \times 100$$

where W_1 = weight of the sample (g.)

W_2 = weight of the round bottom flask (g.)

W_3 = weight of the round bottom flask with fat (g.)

3. Protein content analysis (Kjeldahl method) (Association of Official Analytical Chemists, 2000)

3.1 Weigh the sample to get the permanent weight (0.5-2.0 g.) (W). Transfer the sample into the Kjeldahl tube, along with the blank.

3.2 Add 8 g. of catalyst and 20 ml. of concentrated sulfuric acid by tilting the Kjeldahl tube, and gradually pour the acid next to the tube to wash the sample that might be on the side. Shake the sample gently.

3.3 Digest it with a protein digestion kit for one hour or until the solution has no color. Turn off the digestion kit and wait until the solution cools down at room temperature. Do not cool down the digest tube with cold water because the tube may break.

3.4 Connect the solution to the distillation unit using the erlenmeyer flask filled with boric acid, 50 ml., 4% w/v concentration, and add 6-10 drops of indicator, sodium hydroxide solution 50% w/v concentration (about 70-90 ml.). If the alkali volume is high enough, the solution is black otherwise, add 5-10 ml. of sodium hydroxide solution.

3.5 Turn on the distillation unit. Titrate the acquired solution with a sulfuric acid solution to the endpoint; pink color appears and the solution turns gray and purple

$$\text{Nitrogen volume (\% of weight)} = \frac{(V_a - V_b) \times H_2SO_4(N) \times 1.4007}{W}$$

where V_a = volume of sulfuric acid standard solution used to titrate the sample (ml.)

V_b = volume of sulfuric acid standard solution used to titrate the blank (ml.)

H_2SO_4 = concentration of sulfuric acid standard solution (N)

W = weight of the sample (g.)

Protein volume (% of weight) = Volume of nitrogen (% of weight) x Factor

4. Fiber volume analysis (Crude fiber) (Association of Official Analytical Chemists, 2000)

Analyze the crude fiber volume with sample digestion with acid and alkali under the set condition. Cook the residue from the digestion and burn it to determine the loss volume after burning, which is crude fiber volume.

Chemicals preparation:

1) Sulfuric acid; H_2SO_4 , 1.25% of concentration (0.255 ± 0.005 molar). Weigh 14.17 ml. of sulfuric acid and add it to the distilled water. Transfer into the one-liter volumetric flask, and adjust the volume with the distilled water.

2) Sodium hydroxide; NaOH, 1.25% of concentration (0.313 ± 0.005 molar). Weigh 12.375g. of sodium hydroxide and dissolve with the distilled water. Transfer into the one-liter volumetric flask, and adjust the volume.

Analysis method:

1) Weigh the sample that contains less than 1% of fat or one gram of the fat-extracted sample (W_1). Put it in the 500 ml. beaker.

2) Weigh sulfuric acid, 200 ml., 1.25% concentration with the cylinder, and put it in the beaker containing the sample. Boil the beaker, which is covered with the 500 ml. round glass bottle filled with distilled water to prevent evaporation, on the electric oven. Set the clock for 30 minutes after boiling.

3) Filter it immediately with Buchner No.541 (W_2) (that is cooked and dried to know the permanent weight) using the vacuum force.

4) Wash the residue on the beaker with hot water into the Buchner.

5) Wash the residue on the filter paper with hot water until the acid fades away. Test with the filtered solution; the color of litmus paper should not change from blue to red.

6) Weigh sodium hydroxide, 200 ml., 1.25% concentration and put it into the 500 ml. beaker. Heat it on the electric stove and pour it into the bottle. Wash the waste on the filter paper into the 500 ml. beaker.

7) Boil it on the electric stove and use the round bottom bottle to close the beaker tightly to prevent evaporation. Set the clock for 30 minutes after boiling.

8) Filter it immediately with Buchner No.541. Spray distilled water until it completely closes to the Buchner. Wash the remaining on the beaker with hot water into the Buchner.

9) Wash the residue on the filter paper with hot water until the alkali disappears with the filtered solution; the color of litmus paper should not change from red to blue.

10) Put the filter paper on the porcelain cup (W_3) and bake it in the hot air oven at $102 \pm 2^\circ\text{C}$ for 3 hours. Cool it down in the desiccator and weigh it (W_4).

11) Burn the porcelain cup with the baked filter paper in the kiln at $550 \pm 25^\circ\text{C}$ for one hour. Cool it down in the desiccator and weigh it (W_5).

$$\text{Fiber volume (\% of weight)} = \frac{(W_4 - W_3 - W_2) - (W_5 - W_3)}{W_1} \times 100$$

where W_1 = weight of the sample (g.)

W_2 = weight of filter paper (g.)

W_3 = weight of porcelain cup (g.)

W_4 = weight of porcelain cup, filter paper, and waste after drying (g.)

W_5 = weight of porcelain cup and waste after burning (g.)

4. Carbohydrate volume analysis by calculation (Association of Official Analytical Chemists, 2000)

Carbohydrate volume (% w/v) = 100 - (percentage of moisture + percentage of protein + percentage of fat + percentage of ash + percentage of fiber)

Statistical Analysis: Analysis of variance (ANOVA) was applied to analyze nutritive value by setting the experiment plan with the CRD (Completely randomized design). Meanwhile, RCBD (Randomized Completely Block Design) was used to evaluate the sensory preference. The difference in average was compared using Duncan's New Multiple Range Test with a significance of 0.05.

Human Subjects Protection

This research was approved by the human research ethics by Ethics Committee, Health Science Department, Research and Development Institute, Suan Dusit University, certified No. SDU-RDI-HS 2022-023, dated 14 June 2022. The researcher declared all information, issued the information sheet, answered all questions, and acknowledged the right to withdraw from the project without condition or impact on work. The researcher signed the consent form.

Research Results

Community Context, Community Identity, Local Food Wisdom and Local Wisdom Inheritance Related to Local Food of Ko Koet Community, Ayutthaya

The study of data and survey of healthy food raw materials from local wisdom with the environmentally conservative process (Green Gastronomy & Low-carbon) in Ko Koet Community, Bang Pa-in District, Ayutthaya revealed that the source of raw materials, such as vegetables and meat, was from the local region and natural resources in the community. Ko Koet Community is located near the Chao Phraya River, so it is the plentiful area, particularly the aqua animals, such as fish and prawns. Such raw materials change through the season. Apart from natural raw materials, there are raw materials from the homegrown garden and markets in the community. Knowledge about the cooking of Ko Koet Community is the knowledge transfer from generation to generation; it is carried on from the ancestors to parents and becomes the identity that is different in each household. Anyhow, the taste, raw materials, components, and cooking methods are similar. Most of the food are diverse, but mostly the type of soup, curry, and dips or appetizers because of the simple cooking method and less cooking time that suits the people's way of life. Most ingredients of curry paste and dips include dried chili, bird's eye chili, garlic, shallot, lemongrass, galangal, and ginger, which are Thai herbs from the homegrown garden. It reflects the simple way of life and the fertility of natural resources. Consequently, types of local food in Ko Koet Community are diverse, such as meat dishes and desserts, which are the daily food or seasonal food, or food that is cooked specially in the traditional festivals or is available in the community only, such as Kang Makok Nam (*Elaeocarpus hygrophilus* Flower Curry), Tai Pla Kung (Fish Organ Sour Soup with Shrimp), etc.

Interview results with the community philosophers and community mainstay, who are local food experts in Ko Koet Community (Figure 1) illustrated that the identity of Ko Koet was the lifestyle that related to the river, especially the Chao Phraya River, which is the main river

nourishing people in Ko Koet Community since it was established until the present. It was an important natural resource for the living of community members, lifestyle, customs, traditions, cultures, and wisdom. Local food wisdom and local wisdom transfer of Ko Koet Community were classified into two types.

1) Local food wisdom transfer to the family member - The key person who played an important role was the elderly people, mostly female, such as a grandmother, mother, or aunt because it related to the living culture that females take care of the cooking and household tasks while males earn an income to support the family from farming. Therefore, knowledge about cooking is with females. It is the intangible knowledge that had no record but was transferred via the narration or practice, from finding raw material sources, selecting raw materials, and cooking methods, such as how to choose the blooming flower of *Elaeocarpus hygrophilus* to avoid the astringent flavor or how to choose the fresh fish for making a sweet and odor Kang Liang soup.

2) Local food wisdom transfer to outsiders who are mostly tourists - Currently, Ko Koet Community is interested by the number of Thai and foreign cultural tourists. Before the hit of COVID-19, Ko Koet Community applied local food wisdom to organize the learning station activity where the community philosopher provided knowledge to tourists via the narration of background, practice, raw material preparation, and tasting, such as Khanom Khao Yaku (Culina) Station, elixir herbs Station, Mee Krob (Sweet Crispy Noodles) Station, etc. Consequently, tourists gained knowledge about local food wisdom via self-learning and practice.



Figure 1 Interview Ko Koet Community, Ayutthaya

Source: Jainan et al. (2022)

Healthy Food Recipes from Local Wisdom with the Environmentally Conservative Process to Promote the Gastronomy Tourism of Ko Koet Community, Ayutthaya

The two developed healthy food recipes from local wisdom with the environmentally conservative process in Ko Koet Community: Tom Yum Kung Maenam and Kang Liang Kung (Figure 2), were accepted by consumers in the community (Table 1). The preference score was high to the highest; the score was 6.48-7.48 (Table 2) from the use of the 9-point Hedonic Scale. Both menus exhibited the community identity and narrated food local wisdom to interest people and set the economic value. Both menus were popular as the daily meal or for traditional events. Cooking methods and ingredients were from natural sources in each season. The developed healthy food recipes from local wisdom with the environmentally conservative process had the hygienic cooking process, accurate raw material preparation, and the adjustment of raw material for the higher nutritive value. Only local raw materials were used, which were garlic, shallot, chili, pepper, lemongrass, galangal, bilimbi, kaffir lime leaf, tamarind, finger root, banana blossom, luffa gourd, ivy gourd leaf, pumpkin, hairy basil, *Melientha suavis*, star gooseberry shot, and local vegetables which mostly green, yellow, and orange vegetables with health promotion properties, such as inhibit microorganism, prevent

the flu, activate detoxification, reduce cholesterol, blood pressure, and blood sugar, resist free radical, minimize the risk of cardiovascular disease and cancer, etc.



Figure 2 Tom Yum Kung Maenam and Kang Liang Kung
Source: Jainan et al. (2022)

Table 1 Information of Respondents about Tom Yum Kung Maenam and Kang Liang Kung

Information		Percentage
Gender	Male	44
	Female	56
Age	Under 20 years old	2
	21-30 years old	14
	31-40 years old	82
	Over 41 years old	2
Education	Under bachelor's degree	88
	Bachelor's degree	12
	Master's degree	-
	Higher than master's degree	-
Occupation	Student	-
	Freelance	92
	Government/State enterprise employee	-
	Employee/Worker	-
	Merchant/Business owner	8
	Others (please state)	-

Table 2 Average Score of Sensory Quality Test for the Consumer's Acceptance of Tom Yum Kung Maenam and Kang Liang Kung

Sensory Quality	Tom Yum Kung Maenam	Kang Liang Kung
Appearance	7.44±0.96	7.66±0.75
Color	7.38±0.79	7.77±0.80
Odor	7.51±0.68	7.57±0.99
Flavor	7.29±0.92	7.17±0.90
Taste	7.44±0.74	7.80±0.59
Texture	7.57±0.96	7.10±0.83
Total preference	7.72±0.77	7.90±0.91

Nutritive Value Promoting Health Food Recipes from Local Wisdom with the Environmentally Conservative Process

The nutritive value analysis comprised carbohydrates, proteins, fats, moisture, and fibers. Results demonstrated that Tom Yum Kung Maenam gave energy with 2.97% of carbohydrates, 19.56% of protein, 8.33% of fat, 0.33% of fibers, and 66.61% of moisture. Meanwhile, the nutritive value of Kang Liang Kung contained 2.46% of carbohydrates, 6.81% of proteins, 0.80% of fat, 0.24% of fibers, and 88.85% of moisture, as detailed in Table 3.

Table 3 Nutritive Value of Recipe Model of Gastronomy Culture of Ayutthaya, Port of the East

Nutritive Value	Tom Yum Kung Maenam	Kang Liang Kung
Carbohydrate (%)	2.46	2.97
Protein (%)	6.81	19.56
Fat (%)	0.80	8.33
Moisture (%)	88.85	66.61
Total fibers (%)	0.24	0.33

Discussion

The research on healthy food wisdom from local wisdom in Ko Koet Community, Bang Pa-in District, Ayutthaya, showed that the surrounding natural resource was the Chao Phraya River, so it is a plentiful area. Consequently, the raw materials for cooking were from the local region, including vegetables and meat, which changes through the season. Moreover, knowledge about cooking in Ko Koet Community was the knowledge transfer from generation to generation, from the ancestors to parents, and became the local identity reflecting the simple way of life. Thus, the local menus were varied, and mostly for daily or seasonal consumption. Interview results with the community philosophers and community mainstay who were local food wisdom experts in Ko Koet Community revealed that the identity of Ko Koet Community was the lifestyle that related to the water, particularly the Chao Phraya River, which was the main river to nourish the community members since the community was established. For this reason, it was the essential natural resource for living, lifestyle, customs, traditions, cultures, and wisdom that finally led to the transfer of identity, wisdom, and knowledge from the ancestors to the current generation. The transfer of local wisdom about local food of Ko Koet Community was classified into two categories: knowledge transfer to the family members and to the outsiders.

The two developed healthy food recipes from local wisdom with the environmentally conservation process to promote the gastronomy tourism of Ko Koet Community, Bang Pa-in District, Ayutthaya were Tomyum Kung Maenam and Kang Liang Kung, which was accepted at the preference score was 6.82 and 7.10, respectively. The acceptance was corresponded with the research results of Anuntatanachai et al. (2010) who discovered that 24 healthy Thai food recipes based on the sufficiency economy were accepted by the consumers in the community; the acceptance score was at a high to the highest level. Besides, the results from Egkantrong et al. (2010) indicated that the 40 developed local food recipes for elderly people were accepted with the high and highest level of preference. It was in line with the study of Wongarun (2019) who evaluated the acceptance of local food recipes in Thong Mongkol Sub-district, Bangsaphan District, Prachuab Kirikhan, and found that 30 local food dishes had a high level of acceptance score. Both healthy food recipes from local wisdom were cooked with local raw materials, and homegrown and organic vegetables, which contained herbal properties and promoted health. Consequently, the community members were healthy.

Ayutthaya gastronomy tourism of Ko Koet Community, Ayutthaya Province has a different identity of food culture and seasonal raw materials, which affect food savor. The selected raw

material identifies the geographical indication (GI) showing the identity of Ko Koet Community, particularly local seasonal vegetables containing nutritive values which is good for health, via cooking with an easy local style, which reflects the simple way of life. It is an activity of gastronomy tourism via learning about food culture from local wisdom with an environmentally conservative process (Green Gastronomy & Low-carbon) via the participation and management by the local (community-based Tourism). Activities are designed for tourists to take part in food culture learning and simple lifestyle, which exhibit healthy food cooking from local wisdom with an environmentally conservative process. Tourists learn and pick organic seasonal vegetables containing nutrition and medical properties, which the knowledge has been transferred from generation to generation, to cook with the simple cooking process and eat together. The culture exchange process emerges from the selection of raw materials, cooking steps, decoration, serving, eating style, savor, and nutritive values that food is the medium of exchange between tourists and the community. Consequently, it generates income for the community and adds value to the community economy via gastronomy tourism that strengthens the community sustainably.

The analysis results of the nutritive value of the developed healthy food recipes from local wisdom with the environmentally conservative process demonstrated that Tomyum Kung Maenam and Kang Liang Kung had been significant healthy food since the Ayutthaya period and were eaten widely in Thailand. They contained nutrients that were beneficial for the body, especially Kang Liang, which was very good for health as it was cooked with vegetables, and gave low energy but high fibers. Meanwhile, it contained vitamins, minerals, and bioactive compounds, such as beta-carotene or flavonoid for disease prevention. Moreover, both Tomyum Kung Maenam and Kang Liang Kung gave low energy and fat. It was consistent with the study of Charoenkiatkul et al. (2003) who reported that rice and Kang Liang, as well as spicy salad dishes, contained low fat and suited a person who was under the weight and fat control process. It could be served to the person who wanted to control body fat, especially a person with hypertension who must avoid high-fat food. Therefore, if the community members focused on healthy food consumption that suited their health conditions, it would help to minimize the risk of diseases without using drugs. When comparing the nutritive value of both menus with the ready-to-eat from the convenience stores, both menus contained higher protein and lower carbohydrates. That being said, both menus had complete nutrients. It was explicit that the community had knowledge about cooking with local vegetables. If the community members have additional knowledge about the benefits and nutritive value of local vegetables, the outcome would correspond with the research results of Herforth (2010) who discovered that factors affecting more local vegetable consumption was the knowledge about medicinal properties of local vegetables and positive attitude. Study results of Suphaphiphat (2016) showed that Alaska females recognized that food from local wisdom had economic value and enhanced their health more than food from restaurants. The increasing consumption of food from local wisdom had a positive relationship with the higher quality score. In addition, knowledge providing and the promotion of consuming food from local wisdom would increase the overall nutritional status and good health in the long term.

Conclusion

The study food wisdom and develop healthy food recipes from local wisdom using the environmentally conservative process (Green Gastronomy & Low-carbon) to promote gastronomy tourism in Ko Koet Community, Ayutthaya Province healthy food recipes to promote gastronomy tourism in Ko Koet Community, Ayutthaya Province were Tom Yum Kung Maenam (River Prawn Spicy Soup) and Kang Liang Kung (Thai Spicy Mixed Vegetable Soup with Prawn), which were the identity of the region. Ingredients were the river prawn, herbal vegetables, i.e. shallot, garlic, chili, ginger, galangal, lemongrass, eggplant, Phak Wan

(*Melientha suavis*), and local vegetables in Ko Koet Community, Ayutthaya. Both recipes were healthy food initiated from local wisdom with the environmentally conservative process accepted by consumers. The level of acceptance was moderate to high. Both menus were healthy food with a nutritional balance created based on local wisdom using the environmentally conservative process and appropriate for promoting the gastronomy tourism of Ko Koet Community, Ayutthaya Province.

Suggestions

Research results could be applied as the guidelines for further research by studying the process for enhancing local food potential to be souvenirs to correspond with the development of success of participatory community tourism (private and government sectors) for the balance of community in tourism.

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